THE UNIVERSITY OF ALBERTA

HUNTER ATTITUDES TOWARD WILDLIFE LAWS AND WILDLIFE OFFICERS: AN ANALYSIS OF FORMATIONAL ASPECTS

by

© MICHAEL JOHN MELNYK

A THESIS
SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND
RESEARCH IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF
MASTER OF SCIENCE
IN
RURAL SOCIOLOGY

DEPARTMENT OF RURAL ECONOMY

EDMONTON, ALBERTA
SPRING, 1977

THE UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled "Hunter Attitudes Toward Wildlife Laws and Wildlife Officers: An Analysis of Formational Aspects," submitted by Michael John Melnyk in partial fulfilment of the requirements for the degree of Master of Science.

Supervisor

Date March 28, 1977.

ABSTRACT

In recognition of the need for a greater understanding of the human dimensions of Wildlife Law enforcement, hunter attitudes toward Alberta's Wildlife Laws and Officers were examined. A questionnaire survey was administered to a sample of 1,182 Wildlife Region 7 resident hunters which yielded a 50.4% usable response.

Hunter attitudes were examined within a theoretical framework of attitude formation. It was proposed that attitudes are acquired through two general types of contact with the attitude object. Direct contacts in the form of accumulated past experiences or a single salient experience were hypothesized to be directly related to attitude favorability. An individual's attitude was also expected to be influenced indirectly through values acquired through socialization and the attitudes of significant others.

The violation situation was considered a salient experience for a hunter which would influence his attitude toward Wildlife Laws and Officers. It was hypothesized that known Wildlife Law violators would have less favorable attitudes than non-violators. Violator attitudes toward Wildlife Laws and Officers were found to be significantly less favorable than those of the non-violators, supporting the salient experience hypothesis.

The nature of the hunters' overall experiences with Wildlife Officers were estimated through their ratings of quality of contacts with Wildlife Officers. A direct relationship was hypothesized between quality of contact with Wildlife Officers and attitude favorability toward Wildlife Laws and Officers. Significant positive correlations supported this hypothesis.

Investigation of indirect influence on attitude favorability examined the hunters' value structures and their significant others' attitudes. It was hypothesized that hunters with differing value structures would differ in their socio-economic and demographic backgrounds and in their attitudes toward Wildlife Laws and Officers. However, it was found that differences in background and attitude favorability were not related to differences in value structures among hunters. Hunters' perceptions of significant others' attitudes were hypothesized to be directly related to their own. Significant correlations between hunter and significant other attitudes toward Wildlife Laws and Officers supported the hypothesized relationships.

Those variables found to be significantly related to attitude favorability among hunters were included in a multiple regression model which used Wildlife Law and Officer attitudes as dependent variables. Included as independent variables were violation status, quality of officer contact, significant others' attitudes, age and residence. In both regression models, quality of contact was the most prominent in explaining attitudinal variation. The other independent variables had very little or no significant explanatory power. This indicates that direct contact with Wildlife Officers is by far the most influential factor in determining the favorability of hunter attitudes toward Wildlife Laws and Officers. Although slight relationships were found in the indirect contact area, these were generally not significant in multivariate analysis.

ACKNOWLEDGEMENTS

I am deeply indebted to the Field Services-Enforcement Branch of Alberta Fish and Wildlife for its generous funding throughout the course of this study. The efforts of Mr. E.J. P[illegible]kla and Maureen Ondrus in helping make this research a reality are greatly appreciated.

I am also very grateful for the thoughtful help and encouragement of my supervisor, Daryll G. Murri. His guidance helped to overcome many problems associated with the study. Special thanks are also extended to Dr. W.E. Phillips, Dr. W. Meloff and the Department of Rural Economy staff for their valuable contributions.

Finally, I wish to thank my wife, Christa, for her endless support and patience with me during the course of my studies.

TABLE OF CONTENTS

Page

ABSTRACT iv

ACKNOWLEDGEMENTS vi

LIST OF TABLES ix

LIST OF FIGURES xi

CHAPTER

I INTRODUCTION 1

A General Overview 1
Statement of the Problem and Objectives of the Study 3
Justification of the Study 5

II THEORETICAL FRAMEWORK 8

Conceptual Aspects 8
Major Theoretical Perspectives 12
Development of a Theoretical Framework 21

III METHODOLOGY 43

The Study Area 43
Design of the Study 44
Sampling Procedures 45
Construction of the Survey Instrument 50
Measurement of Attitudes 53
Limitations of the Study 55

IV HUNTER CHARACTERISTICS 59

Sample and Subsample Profiles 59
Hunter Profile Summary 69

V ANALYSIS OF FACTORS WHICH DIRECTLY OR INDIRECTLY INFLUENCE ATTITUDE FAVORABILITY 71

Direct Contact with the Attitude Object 71
Indirect Contact with the Attitude Object 79
Attitude and Intentions 87

VI MULTIVARIATE ANALYSIS OF DIRECT AND INDIRECT INFLUENCE ON ATTITUDE FAVORABILITY 90

Wildlife Law Attitudes 92
Attitudes Toward Wildlife Officers 96

CHAPTER Page

VII SUMMARY, CONCLUSIONS AND RECOMMENDATIONS 100

General Findings 100
Recommendations 103

BIBLIOGRAPHY 107

APPENDIX A: THE QUESTIONNAIRE AND COVERING LETTERS 112

APPENDIX B: COMPARISON OF THE STUDY SAMPLE TO THE REGION 7 HUNTER POPULATION 123

APPENDIX C: SCALING OF ATTITUDES AND RELATIONSHIPS TO THEORY 127

LIST OF TABLES

Table		Page
3.1	Response Trends of Questionnaire Mailouts	47
3.2	Residence of First and Second Mailing Respondents	48
3.3	Age of First and Second Mailing Respondents	48
3.4	Secondary Education of First and Second Mailing Respondents	49
3.5	Seasons Hunted of First and Second Mailing Respondents	49
3.6	Violation Status of First and Second Mailing Respondents	49
4.1	Age Distribution of Hunters	60
4.2	Sex of Hunters	61
4.3	Marital Status of Hunters	62
4.4	Residence of Hunters	63
4.5	Secondary Education of Hunters	64
4.6	Post-Secondary Education of Hunters	64
4.7	Income of Hunters	65
4.8	Occupation of Hunters	66
4.9	Hunting Experience	68
4.10	Hunter Training	68
4.11	Hunting Companionship	69
4.12	Association Membership of Hunters	70
5.1	Difference of Means Tests for Violator/Non-Violator Attitude Scores	76
5.2	Correlations of Wildlife Law and Wildlife Officer Attitudes with Quality of Contact with Wildlife Officers	78
5.3	Comparison of Overall Quality of Officer Contact for Violators and Non-Violators	79

Table		Page
5.4	Value Ranking Correlations for Background Variable Subgroups	82
5.5	Background Variable Relationships with Wildlife Law Attitude Favorability	83
5.6	Background Variable Relationships with Attitudes Toward Wildlife Officers	84
5.7	Value Ranking Correlations of Hunters of Differing Attitude Favorability	85
5.8	Correlations of Hunter Attitudes with Significant Others' Attitudes	86
5.9	Crosstabulation of Hunter and Significant Other Wildlife Law Violation Status	88
5.10	Correlations of Hunter Attitudes with Intentions	89
6.1	Correlation Matrix for Specified Variables in WLAT Regression	92
6.2	Stepwise Wildlife Law Attitude Regression Results	95
6.3	Correlation Matrix for Specified Variables in WOAT Regression	97
6.4	Stepwise Wildlife Officer Attitude Regression Results	98
B-1	Age Distribution for the Region 7 Hunter Population and the Study Sample	125
B-2	Sex Distribution for Region 7 Hunter Population and the Study Sample	126
C-1	Comparison of Thurstone and Likert Scaling Techniques	132

LIST OF FIGURES

Figure		Page
2.1	Conceptual Framework Relating Beliefs, Attitude Intentions and Behavior	25
2.2	A First Order Concept	28
2.3	A Second Order Concept	29
2.4	A Simple Attitude	29
2.5	Classical Conditioning of an Attitude	31
2.6	The Proposed Theoretical Framework	39
3.1	Design of the Present Study	45
5.1	Violator Non-Violator Wildlife Law Attitude Scores	74
5.2	Violator Non-Violator Wildlife Officer Attitude Scores	75

CHAPTER I

INTRODUCTION

A General Overview

During the current decade, effective environmental and natural resource management have surfaced as major concerns of government. Wildlife Management has not been unlike other natural resource conservation fields in that today's greater awareness of the vulnerability of resources has brought about more intensive management thus generating new and more complex problems. In a broad perspective, Wildlife Management serves to assure the protection and maintenance of all wildlife in its natural environment. Too often the public perceives Wildlife Management programs as those primarily concerned with species managed for recreational sport hunting or those species receiving special status because of their "endangered" categorization. Reflecting upon the narrower aspect of "Game Management" per se, it has been termed as "the art of making land produce sustained annual crops of Wildlife for recreational use."[1] In this perspective, successful management of Wildlife in response to recreational demand requires that protection, regulation and meaningful law enforcement exist as functional-components in a management program.

A distinguishing characteristic in Wildlife Management is the fact that man's recreation is intimately involved. Because such a large part of Wildlife Management involves the regulation of recreational activities relating to resource utilization, it can be expected that sensitive issues not commonly found in other fields will occur. While policy direction must be followed and legislation effectively enforced, the effects of such legislation on the major resource user groups must also be understood. Legislation governing the utilization of Wildlife is designed to facilitate an acceptable harvest of the available resource. Public understanding of such laws is an important requirement if mangement objectives are to be effectively realized.

---

[1] William B. Morse, "Law Enforcement: A Tool of Management" in Readings in Wildlife Conservation, eds. J.A. Bailey, et al., (Washington, D.C.: The Wildlife Society, 1974), p. 551.

One of the steps which ~~should be~~ involved in effective Wildlife Management is to determine how those people affected by related legislation feel toward it. The Canadian Wildlife Service is of the opinion that successful Wildlife Management involves the development and enforcement of regulations which balance the interests of sportsmen, naturalists, farmers and a variety of other social groups.[1]

The implications of human motivational factors involved in Wildlife recreational pursuit have more recently surfaced as significant aspects of management planning. Successful management cannot function without public support and this support should result from sound policy. A large part of policy making in this area concerns law enforcement which in one way or another affects all other Wildlife Management Programs.[2] Because public contact with Wildlife Agencies is primarily through the Wildlife Officers themselves, it is important that the Officers establish a credible and acceptable image of their resource agency in the eyes of the public.

The nature of the laws enforced by Wildlife Officers often contribute an essential element not commonly present in most other forms of law enforcement. In order that conservational concepts be maintained certain Wildlife Laws are designed to permit hunters an equitable opportunity to share in the harvest of the resource. This aspect inherent in Wildlife Regulations necessitates that a Wildlife Officer recognize the difficulty in applying professional law enforcement standards within an atmosphere of recreational pursuit.

---

[1] Canadian Wildlife Service, Wildlife in Man's World (Ottawa: Queen's Printer, 1964), p. 6.

[2] Morse, "Law Enforcement: A Tool of Management", p. 551.

Each time an officer interacts with some member of the public, whether a hunter, landowner or naturalist, he is engaged in some aspect of education. As a result, the information a Wildlife Officer gives and the impression he leaves are influencing factors in the public's acceptance of long range management policies. In a general sense, the Wildlife Officer acts as a liason between the public and the agency. He interacts daily with a wide variety of people and is usually recognized as an agency's representative at the local level.

Public lack of confidence regarding the manner in which an agency is carrying out its Wildlife Management practices could impair the success of current and future program direction. For this reason, it is the intent of this thesis to investigate the attitudes and opinions of hunters toward Wildlife Laws and the Officers who enforce them. The study can assist law enforcement administrators in assessing research needs, and it has the potential to identify areas of weakness in the delivery of enforcement programs.

Statement of the Problem and Objectives of the Study

In this study the attitudes of licenced Alberta hunters toward Alberta's Wildlife Laws and Wildlife Officers are investigated. The study group was selected from Alberta's Fish and Wildlife Administrative Region 7. This region was chosen because it includes a large number of hunters of both rural and urban backgrounds. The licencee selection was made from those hunters who purchased licences during the 1975 season. The objectives are to provide answers to the following general problems.

Specifically, this thesis will investigate any differences in attitude between hunters who are known Wildlife Law violators and those hunters not having records of hunting violations in 1975. Hunters actually apprehended for violating Wildlife Laws may exhibit different attitudes than their non-violator counterparts. The fact that known violators have had contact with Wildlife Officers which at one time or another culminated in the issuance of an offence ticket also suggests that there may be differences in attitudes toward Wildlife Officers among known violator and non violator hunters. Differences in attitudes toward Wildlife Officers between these two groups could indirectly result from the manner in which Officers deal with situations involving violations as opposed to those that do not.

Other independent variables aside from violator or non-violator cases which may influence hunter attitudes toward Wildlife Laws and Officers will also be examined. Both favorable and unfavorable attitudes will be isolated according to a variety of socioeconomic and demographic variables such as age, education, income, occupation, residence and hunting experience. If it can be demonstrated that sources of unfavorable attitudes among hunters are over represented in particular social subgroups, then it could be an aid in directing enforcement efforts toward the identified areas.

Further exploratory analysis will also be undertaken to examine the socio-economic differences among known Wildlife Law violators and non-violators. It is possible that violators and non-violators may exhibit differences in their background characteristics. If there are significant differences in characteristics, this information could be helpful for the agency in orienting its Wildlife Officers' interactive skills toward better dealing with these different groups.

The analysis of hunter attitudes is to be performed within a theoretical framework concerning attitude formation and organization. Testable hypotheses developed from this framework are to guide empirical analysis in later chapters and aid in explaining any relationships found among the study variables.

Justification of the Study

The importance of this thesis to the field of Wildlife Management can be better exemplified by considering the general trends of research in this area. Recently, literature in this field seems to be leaning steadily toward the human dimension in its emphasis. For instance, Thomas More writing on hunter attitudes suggests that there are a wide variety of intangible, non-consumptive benefits which serve, at least in part to determine hunting satisfaction.[1] This implies that management for the quality not quantity of experiences is needed, necessitating that Wildlife Agencies better understand the motivating factors behind hunter behavior. Similarly, Bernard Schole has presented a comprehensive review of the literature concerning hunter characteristics. In this review, such things as demographic differences, reasons for hunting, differences among hunter types and comparisons of hunters to other outdoor recreationalists are covered. In assessing the research situation as a whole, Schole concludes that there are obvious research needs in the area of hunter behavior, attitudes and satisfactions. It is his opinion that research in these areas should receive high priority if recreational benefits of hunting are to be maximized.[1]

---

[1] Thomas A. More, "Attitudes of Massachusetts Hunters", 36th North American Wildlife and Natural Resources Conference Transactions (Washington, D.C.: Wildlife Management Institute, 1971), pp. 230-234.

Research has also shown that although hunters are a social group with definite interests and values, they cannot be viewed as entirely homogeneous. Past research has shown that hunter sub-groups may vary distinctly in terms of their preferences, opinions and behavior. For instance, considerable attention has been given to the differences in attitudes, perceptions and behavior of known hunter violators and non-violators of Wildlife Law. Generally, significant differences in attitudes across a wide variety of dimensions for these two groups have been reported. The general conclusion reached by these studies is that the differences in attitudinal favorability toward Wildlife Laws and their enforcement presents a serious problem. Negative attitudes on behalf of some hunter groups suggest a lack of confidence in the purpose of game laws. Thus if effective conservational management is to be accomplished, both sound legislation based on thorough knowledge of resource user groups and programs designed to educate the public on the nature and purpose of these laws are needed.[2]

---

[1] Bernard J. Schole, A Literature Review on Characteristics of Hunters, Special Report Number 33 (Colorado: Colorado Division of Wildlife, November 1973), p. 8.

[2] E.L. Shafer, P.H. Amidon and C.W. Severinghaus, "A Comparison of Violators and Non-Violators of New York Deer Hunting Laws," Journal of Wildlife Management 36 (1972), pp. 933-939.; James A. Kesel, "Some of the Characteristics and Attitudes of Michigan Deer Hunting Violators" (M.Sc. Thesis, Michigan State University, 1974), pp. 9-13, 18-22, 23-27.; Gregg D. Stoll, "The Attitudes of Recreational Resource Users Arrested by Michigan Conservation Officers" (M.Sc. Thesis, Michigan State University, 1975), pp. 57-58, 64-70, 79.

Although these types of studies do show evidence of a problematic situation for Wildlife Management, they are lacking in terms of a theoretical explanation of why attitudes of hunters exist as they do. The attitudinal concept has received scant recognition even though it has been a major variable in much of the past work dealing with hunter behavior. This type of situation has not served to adequately explain the relationships which reportedly exist among a mountain of facts. The unsystematic collection of a wide variety of miscellaneous data dealing with hunter attitudes is not readily conducive to the establishment of sound policies at the legislative level. It is necessary to link empirical data to a theoretical base if a logical explanation is desired.[1] This perspective will be the major guiding force throughout this thesis. The attitudinal concept in this study will be viewed in relatively greater detail than previous work on hunter attitudes in an effort to provide the necessary means by which to logically explain the various types of relationships which may be found to exist among selected variables.

---

[1] Hubert M. Blalock, Jr., Theory Construction (Englewood Cliffs, New Jersey: Prentice-Hall Inc., 1969), p. 2.

CHAPTER II

THEORETICAL FRAMEWORK

Conceptual Aspects

Just over forty years ago Gordon Allport wrote: "The concept of attitude is probably the most distinctive and indispensible in contemporary American social psychology."[1] Although the importance of the attitude concept as considered by Allport is indeed clear, it is also evident that even at that time there was ample disagreement as to its actual worth. In fact, Allport reports that by 1935 some writers were actually defining social psychology as the scientific study of attitudes while others were maintaining that the indefinite meaning of the concept seriously called its scientific status into question.[2] The variety of differing conceptual definitions of attitude considered by Allport also exemplifies the diversity and dissension in the field at that time. While it was admitted that the overworking of the attitude concept could lead to its discard altogether in social psychology, Allport remained optimistic that future critical and analytical research would succeed in refining and preserving the attitude concept.[3]

Whether subsequent social psychologists have done justice to Gordon Allport's hopes is presently debatable. Although enough theorizing and research has been done in the attitude area to probably fill a small library, dissension at the conceptual level still remains and if anything is even more pronounced. The present diversity of thought in attitude theory has not effectively served to bring the field into focus. In fact, various authors such as Anthony Greenwald who are skeptical of adding more conceptualizations to the attitude area feel that progress can only be made by some effort to reconsolidate and refine the existing approaches.[1]

---

[1] Gordon W. Allport, "Attitudes," in A Handbook of Social Psychology, ed. Carl Murchison (New York: Russell and Russell, 1935), p. 798.

[2] Ibid.

[3] Ibid. pp. 804-805.

Although many problems admittedly still exist in the attitude area, there have been attempts to utilize the recent body of knowledge in order to establish more unified perspectives. Perhaps the most widespread of these attempts is the proposal to divide the construct of attitude into three components. This analysis maintains that attitudes have a cognitive component referring to a person's perceptual or informational beliefs about the attitude object, an affective component which deals with the person's emotional feelings of like and dislike of the attitude object, and a conative component referring to the person's overall behavioral tendencies regarding the object.[2]

This tri-component approach to the study of attitudes has been dealt with by a variety of theorists. For instance, C.A. Insko and J. Schopler have taken this approach and developed it in an attempt to arrive at a theory based on the consistency among the three elements in the triad.[1] Milton Rosenberg has also dealt quite extensively with this approach. Rosenberg defines an attitude as a predisposition to respond in a particular way toward a specified class of objects. The types of response categories fall into the three indicies of attitude previously discussed as the cognitive, affective and conative components. Of primary interest to Rosenberg are the relationships among the three components of attitude and the factors which increase or decrease their correlation.[2]

---

[1] Anthony G. Greenwald, "On Defining Attitude and Attitude Theory," in Psychological Foundations of Attitudes, eds. Anthony G. Greenwald, Timothy C. Brock and Thomas M. Ostrom (New York: Academic Press, 1968), p. 361.

[2] William J. McGuire, "The Nature of Attitudes and Attitude Change," in The Handbook of Social Psychology, Vol. III, eds. Gardner Lindzey and Elliot Aronson (2nd edition; Reading, Massachusetts: Addison-Wesley Publishing Co., 1969), pp. 155-156.

Although the tri-component approach has been favored by many theorists and has grouped together a wide variety of knowledge, this does not necessarily indicate that there are fewer problems in the attitude field. Even in light of the growing popularity of this approach, there still remains considerable criticism that the three-component conceptualization may not truly represent the attitude construct.

Martin Fishbein for example,maintains that while there is no overwhelming reason why 'attitude' could not mean all these things (cognitive, affective and conative components), it should be recognized that labels are merely products established by man for his own convenience. It is Fishbein's contention that the concept of attitude has greater scientific worth when it is given a more restricted meaning. This point of view arises out of the recognition that a multi-component view implies a multidimensional concept. While adoption of a tri-component conceptualization in Fishbein's opinion would not necessarily prove too difficult at the theoretical level, it would pose serious problems for measurement at the empirical level.[1]

---

[1] C.A. Insko and J. Schopler, "Triadic Consistency: A Statement of Affective-Cognitive-Conative Consistency," Psychological Review, 74 (1967), pp. 361-376.

[2] Milton J. Rosenberg, et al., Attitude Organization and Change (New Haven: Yale University Press, 1960), pp. 1-3.

Also skeptical of the three component view of attitudes are Marvin Shaw and Jack Wright. In their opinion, problems arise in the transition from the conceptual to the empirical level when theorists adopt multi-dimensional conceptualizations and yet employ conventional measurement techniques in their analysis. Shaw and Wright are strongly in favor of a more limited conceptualization which views attitudes as evaluative or affective reactions which may be related to other cognitions and overt behavior. This type of approach tends to coincide more with most of the work done to date in the attitude measurement area.[2]

In light of the potential methodological problems faced by applying a multi-component conceptualization of attitude, the approach to be taken in this thesis will correspond closely to those presented by Fishbein, and Shaw and Wright. This view conceptualizes attitudes as undimensional dealing with what tri-component theorists would call the affective dimension. Following from the writings of Martin Fishbein, an attitude will be concisely defined as a person's affective or emotional evaluation (in terms of degrees of positive or negative polarity) of some attitude object.[3] In terms of the tri-component point of view, this approach considers an attitude as only encompassing the affective component. The remaining two components will be dealt with here as the separate and autonomous concepts of belief and behavioral intention. The relationships which exist among these concepts will serve as a groundwork for a more elaborate theoretical framework to be developed in the latter parts of this chapter.

---

[1] Martin Fishbein, "A Consideration of Beliefs and Their Role in Attitude Measurement," in Readings in Attitude Theory and Measurement, ed. Martin Fishbein (New York: John Wiley and Sons Inc., 1967), p. 257.

[2] Marvin E. Shaw and Jack M. Wright, Scales for the Measurement of Attitudes (New York: McGraw-Hill Book Co., 1967), pp. 2-3.

[3] Martin Fishbein and Icek Ajzen, Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research (Reading, Massachusetts: Addison-Wesley Publishing Co., 1975), p. 11.

Major Theoretical Perspectives

The theoretical literature concerning attitudes to date is typified by wide diversity. While there may well be as many conceptual definitions of attitude as there are attitude theorists, much more coherence may be found if the major theoretical perspectives which underly the writings are considered. Anthony Greenwald is of the opinion that although there are many ways in which attitudes may be conceptualized, there are only a limited number of themes which can be expressed in these definitions.[1] In this sense, the theoretical orientations most directly related to the formulation of the theoretical framework used in this thesis are the behaviorist-learning and cognitive consistency approaches.

The Behaviorist-Learning Theory Perspective

Generally, learning theories of attitude seek to explain social attitudes in terms of the basic classical and operant conditioning paradigms. In the classical conditioning situation, an unconditioned stimulus automatically elicits without prior learning, an unconditioned response. In addition to this, there may also be a new stimulus which does not initially elicit the unconditioned response but some other random response. This new stimulus becomes a conditioned stimulus, and will come to elicit some of the response characteristics originally produced only by the unconditioned stimulus. Learning is said to have occurred when the conditioned stimulus is able to autonomously elicit the unconditioned response.[1]

---

[1] Greenwald, "On Defining Attitude and Attitude Theory", p. 364.

In contrast to the classical conditioning situation, operant conditioning (trial and error learning) involves a situation in which the organism emits various different responses to a stimulus situation. When one of the responses becomes reinforced, or in other words becomes instrumental to obtaining some reward, that response becomes instrumental to learning. After repeated trials with one of the particular responses continually reinforced, instrumental learning has taken place.[2]

One of the earliest applications of the learning theory approach to the attitude area was by Leonard Doob in 1947. He considered an attitude as being an implicit, drive producing response which is socially significant in the individual's world. In this sense, an attitude is an implicit response with drive strength which occurs within the individual as a reaction to stimulus patterns, and which affects subsequent overt responses. While the attitude can be seen as a response, it also serves as a stimulus and drive for overt behavior.[3] The point of emphasis is that attitudes are closely tied to overt behavior. Doob's rationale for this type of approach was that virtually all attitude theorists, regardless of their bias, agree that attitudes are learned. Thus the learning, retention and extinction of attitudes should follow the same learning principles as the learnings of any other motor skills.[1]

---

[1] Fishbein and Ajzen, Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research, p. 22.

[2] Ibid., p. 23.

[3] Leonard W. Doob, "The Behavior of Attitudes," in Readings in Attitude Theory and Measurement, ed. Martin Fishbein (New York: John Wiley and Sons Inc., 1967), p. 43.

About ten years after Doob had made his presentation in the attitude area, Arthur and Carolyn Staats empirically tested basic learning principles in the formation of social attitudes. Classical conditioning was the paradigm tested for attitude formation. Results of the study support the hypothesis that attitudes already elicited by socially significant stimuli can be changed through classical conditioning.[2]

Staats and Staats have also extended the generality of this approach according to what they term the principle of higher order conditioning. This principle maintains that a conditioned stimulus is a word having attained the ability to produce a particular emotional response because it has been paired with some previous significant event in the individual's environment. If still a third word or event is paired with this conditioned stimulus, it will come to produce a similar emotional or affective response. This principle can only be agreed upon if one accepts Staats' earlier proposition that all words or events in the individual's perceived environment have attained the power to elicit emotional responses through previous classical conditioning.[3] In acceptance of this proposition, it can be seen that all aspects of an individual's highly complex interactive history can in some way influence his present attitudes. This approach has more recently been elaborated upon by Staats in an attempt to establish a more comprehensive learning theory of human attitudes. The process termed as higher order conditioning concerned the integration of the classical and instrumental conditioning principles.[1]

---

[1] Ibid., p. 42.

[2] Arthur W. Staats and Carolyn K. Staats, "Attitudes Established by Classical Conditioning," Journal of Abnormal and Social Psychology, 57 (1958), pp. 38-39.

[3] Kiesler, Collins and Miller, Attitude Change: A Critical Analysis of Theoretical Approaches, pp. 97-98.

While a substantial amount of literature could be reviewed in this area, much would tend to follow along the lines discussed here. Essentially most learning theories of attitude deal primarily with the ways in which implicit or evaluative responses become associated with a given stimulus object.[2] Another common thread running through most learning theories of attitude is that they are historical in their explanation. The individual's past interaction with others and his environment are important aspects in explaining his present attitude.

The Cognitive Consistency Perspective

Generally, cognitive theories of attitude have in common some type of pair of polar adjectives and a general paradigm. Different theorists employ the polar adjectives (for example, balance-imbalance, consonance-dissonance, congruence-incongruence, etc.) to describe an individual's cognitions which may be consistent or inconsistent with each other. The basic paradigm employed by most of these types of theories is that inconsistency is a motivating phenomenon for people to alter their cognitive system in order to achieve consistency. The core of consistency models is that individuals strive toward attaining consistency among cognitions of themselves, their beliefs, feelings or actions, and so on. Because inconsistency among these cognitions results in psychological discomfort, individuals are motivated to reduce the tension in their cognitive structure.[1] In this sense consistency models are only slightly different from the psychology of motivation and learning.

---

[1] Arthur Staats, "An Outline of an Integrated Learning Theory of Attitude Formation and Change," in Readings in Attitude Theory and Measurement, ed. Martin Fishbein (New York: John Wiley and Sons Inc., 1967), p. 373.

[2] Fishbein and Ajzen, Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research, p. 25.

The first formal consistency theory in the attitude area was presented by Fritz Heider in 1946. In his original model, Heider was concerned with the balancing of relationships of three elements in a triad, usually a focal person (p), another person (o) and some object or event (x). This was a phenomenological approach concerned with the focal person's perceptions of the relationships involved in the triad. In this triad, the possible types of relationships are: p likes (L) or dislikes ($\overline{L}$) o and x, and perceives a causal unit relation (U) between o and x, or perceives o and x as being segregated ($\overline{U}$). One type of balanced state is said to exist if p feels the same way (that is, either likes or dislikes) toward o and x and perceives a causal unit relation between them. Conversely, imbalanced states may exist within the triad if p feels the same way about o and x and does not perceive a causal unit relationship between o and x (that is, he perceives them to be segregated).[2]

The basic principle of this approach is that a balanced state exists if the relations between the three entities are all positive or if two are negative and one is positive. The dynamic principle underlying the theory is that liking and unit relations tend toward a balanced state. An imbalanced state either forces a change in p's attitude toward o or x or a change in the unit relations between o and x by action or cognitive reorganization.[1]

---

[1] Jerome E. Singer, "Motivation for Consistency," in Cognitive Consistency: Motivational Antecedents and Behavioral Consequents, ed. Shel Feldman (New York: Academic Press Inc., 1966), p. 47.

[2] Fishbein and Ajzen, Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research, p. 33.

Shortly after Heider presented his balance model, various other theorists postulated similar theoretical orientations. In 1953 Theodore Newcombe presented his ABX system. Following a logic similar to Heider's, a state of equilibrium may or may not exist depending upon the nature of the interdependent orientations within the A-B-X triad.[2] Similarly, Charles Osgood and Percy Tannenbaum in 1955 proposed what they called the Principle of Congruity. One of the underlying propositions in this theory is that attitudes tend toward maximum simplicity. In terms of the congruity principle, when two attitude objects (be they person, place or thing) of differing evaluations are linked with an assertion, there is a tendency for the evaluations of each object to shift toward a point of equilibrium or congruity. In order for the principle to apply, the two attitude objects must be linked with an assertion which may be either associative or dissociative.[3]

In 1956, Milton Rosenberg developed a cognitive theory of attitudes different from those above in that it dealt with the intrapersonal sphere. The theoretical propositions underlying this approach maintain that a person who has a relatively stable affect for or against an object, has an accompanying cognitive structure consisting of beliefs about the potentialities of that object for attaining or blocking the realization of valued states. Also, the valence and extremity of the affect are correlated with the content of the associated cognitive structure in terms of whether beliefs with respect to the object facilitate or block the realization of valued states.[1]

---

[1] Ibid.

[2] Chester A. Insko, Theories of Attitude Change (New York: Appleton-Century-Crofts Publishing Co., 1967), pp. 165-167.

[3] Ibid., pp. 112-114.

In later formulations by Rosenberg, belief came to be included within the attitude concept in an explicit statement regarding cognitive-affective consistency. The relationships between what were termed cognitive and affective components of attitudes are summarized by the following passage:

> When the affective and cognitive components of an attitude are mutually consistent, the attitude is in a stable state; when the affective and cognitive components are mutually inconsistent (to a degree that exceeds the individual's present tolerance for such inconsistency) the attitude is in an unstable state and will undergo spontaneous reorganizing activity until such activity eventuates in either (1) the attainment of affective-cognitive consistency or (2) the placing of an irreconcilable inconsistency beyond the range of active awareness.[2]

Rosenberg's approach is similar to other tri-component theories of attitude in that a person's overt actions are guided by his underlying cognitive and affective responses.

Problems Associated with the Two Major Approaches

Each of the two schools of thought presented here are characterized by problems and deficiencies in their explanation of attitudes. It is thought that a brief overview of some of these inadequacies would aid in establishing a rationale for the development of the proposed theoretical framework used in this thesis. An attempt to resolve the various problems and differences between the two approaches could possibly serve to aid in the establishment of a unified body of knowledge in the attitude area.

---

[1] Milton J. Rosenberg, "Cognitive Structure and Attitudinal Affect," in Readings in Attitude Theory and Measurement, ed. Martin Fishbein (New York: John Wiley and Sons Inc., 1967), p. 325.

[2] Milton J. Rosenberg, "An Analysis of Affective-Cognitive Consistency," in Attitude Organization and Change: An Analysis of Consistency Among Attitude Components, by Milton J. Rosenberg, et al. (New Haven: Yale University Press, 1960), Chapter II, p. 15.

The early development of learning theories depended upon research on lower order organisms in a highly controlled laboratory environment. Although there was ample success in this area, learning theorists as a whole encountered problems in their generalization to the attitude area. Learning theories of attitude have often been labelled as mere translations or analogies rather than actual extensions of the original theory.[1] This type of situation has led to a general theoretical oversimplification based upon the commonalities of a heterogeneous group of original theories.

This has also created problems at the empirical level for learning theories of attitude. Extensions of research design from earlier work has led to the advancement of alternative hypotheses contrary to those initially put forth. It has been argued that the demand characteristics of learning theory attitude experiments are easily recognizable by the subjects who would then offer responses appropriate to those of the investigator's wishes.[2] The hypothesis that experimental subjects can recognize the demand characteristics of the experiments directly contradicts the classical conditioning hypothesis.

The possibility of recognizable demand characteristics in learning theory experiments leads to the area of the awareness problem which itself is contradictory to the interpretation of this approach. The extent to which subjects are aware of the investigator's intentions suggests that a simple learning theory model may not be sufficient. Awareness implies the presence of cognitive activity which could conceivably mediate the observed conditioning effect. In general, learning theory research can be characterized by weak theoretical bases and highly contrived or controlled laboratory experimentation not necessarily typical of the real life situations in which attitudes are learned.[1]

---

[1] Kiesler, Collins and Miller, Attitude Change: A Critical Analysis of Theoretical Approaches, p. 91.

[2] Ibid., p. 142.

The various types of consistency theories of attitude have not been without their problems either. Generally, consistency theories lack in conceptual precision, and the terms used in the various models are not altogether clear and rigorous. Since conceptual definitions tend to differ across models not only in form but also in substance, there arises considerable difficulty in inter-theoretical translation.[2]

Consistency models differ in their specification of which elements actually constitute inconsistency. In Heider's balance model the inconsistent elements are attitudes toward persons and objects. In Rosenberg's model the inconsistent elements are the affective and cognitive components of attitude. Other consistency approaches portray similar differences. This type of situation does not serve to bring consistency theories to a unified front and tends to result in largely intuitive theorizing.[3]

There are also other problems arising from these general considerations. In most consistency theories of attitude there is nothing in the description of the cognitive elements which specifies whether they are mutually relevant or irrelevant. Other problems concern individual differences in terms of the importance of the inconsistency encountered, tolerance of cognitive inconsistency and methods of inconsistency reduction. Quantification problems also occur when dealing with the actual extent or degree of inconsistency present. Issues of this type tend to make the predictions of consistency theories rather loose.[1]

---

[1] Ibid., pp. 142-150.

[2] Albert Pepitone, "Some Conceptual and Empirical Problems of Consistency Models," in Cognitive Consistency: Motivational Antecedents and Behavioral Consequents, ed. Shel Feldman (New York: Academic Press Inc., 1966), p. 261.

[3] Ibid., p. 262.

It is apparent that the problems of learning and consistency theories must receive more attention on behalf of the theorists involved in these areas. The diversities existent even among a general theoretical orientation itself are strongly incompatible to the development of a unified body of knowledge in the attitude area. The proposed formulation is an attempt to work toward this type of goal.

Development of a Theoretical Framework

The theoretical framework to be implemented in this study will be largely based upon the recent work of Martin Fishbein. Fishbein recognizes the differences which exist among the learning and consistency theories of attitude, however he suggests that maintaining this distinction only serves to blur the difference between a theory's theoretical origin and the phenomena it deals with.[2] Being a strong proponent of a more unified presentation in attitude theory, Fishbein de-emphasizes the distinction between learning and consistency theories, to distinguishing among the types of variables the different approaches deal with.

---

[1] Ibid., pp. 266-268.

[2] Fishbein and Ajzen, Belief , Attitude, Intention and Behavior: An Introduction to Theory and Research, p. 21.

Fishbein's theoretical model has emerged from the recognition that attitude, belief, intentions, and behavior are four independent (autonomous) variables, although they may have been used interchangably in the past. In this sense, much of the apparent theoretical differences across broad theoretical perspectives can be eliminated if one were to consider exactly what types of concepts and variables different theorists study. Classification of previous research into conceptually different categories will eliminate much of the apparent inconsistencies in the area.[1]

Conceptual Distinctions and Framework

The definition of attitude to be used in this study follows directly from that chosen by Fishbein. In his opinion, this definition is one which most investigators could agree upon. Thus, an attitude is defined as "... a learned predisposition to respond in a consistently favorable or unfavorable manner with respect to a given object."[2] Consistency in this definition refers to behaviors that are consistently favorable or unfavorable over time. Although certain behaviors may not be in correspondence with an individual's attitude, his overall behavioral set with respect to the attitude object is expected to remain constant. Predispositions are taken to refer to the overall favorability of the behavioral pattern. Also, since attitudes are learned, they are considered as residues of a person's past experiences.

The conceptual framework presented by Fishbein involves the relationships between beliefs, attitudes, intentions and behavior. Each of these variables are considered as distinct and autonomous concepts. Attitudes are characterized by their evaluative or affective nature. They are unidimensional and bipolar in nature which renders them amenable to measurement on most conventional attitude scales.

---

[1] Ibid., p. 6.

[2] Ibid.

Beliefs refer to the information an individual has about the attitude object in question. Essentially they link some object to an attribute where both these terms refer to any aspect of the individual's perceptual world. Individuals may differ in their perception of the extent to which a given object is associated with a given attribute, implying that a belief may be measured by a procedure which places the individual along a dimension of subjective probability linking the object and the attribute.

Intention refers to the individual's subjective probability that he will perform some given behavior. Intentions can be considered a special case of beliefs where the object is always the person himself and the attribute is always a behavior. An individual's behavior simply refers to overt actions which are studied in their own right. Fishbein feels that behavior may also be studied to infer an individual's beliefs, attitudes and intentions.[1]

The relationships which exist among these four variables comprise the basis of Fishbein's conceptual model. Beliefs being the fundamental building blocks in this framework, are learned by the individual by direct observation or by various inference processes. In this sense the individual comes to associate a spectrum of objects (that is, all facets of his perceptual world) with various attributes. It is the totality of a person's beliefs which determine his attitudes, intentions and behaviors.

---

[1] Ibid., pp. 11-13.

A person's attitude toward an object is based upon the total set of salient beliefs he has regarding that object. Depending upon the nature of the attributes the individual tends to associate with a given object, his attitude will tend to be either generally favorable or unfavorable. More specifically, a person's attitude toward an object is a function of his beliefs that the object has certain attributes and his evaluation of these attributes. A person's attitude is viewed as a function of his total set of salient beliefs but not necessarily of any specific belief.

Attitudes are related to intentions in a similar fashion. An attitude toward an object is viewed as being related to the individual's intentions to perform a set of behaviors with respect to the object, but not necessarily to any one specific relevant behavioral intention. On the other hand, each intention is viewed as being directly related to its corresponding behavior. Barring unforeseen events, a person should perform those behaviors which he intends.[1] The relationships among the four variables in Fishbein's model are shown in Figure 2.1.

The feedback loops supplied in the diagram imply that the existent relationships are not unidirectional. Once formed, attitudes can influence the nature of a person's beliefs, and the performance of a given behavior may also lead to the establishment of new beliefs about the attitude object.

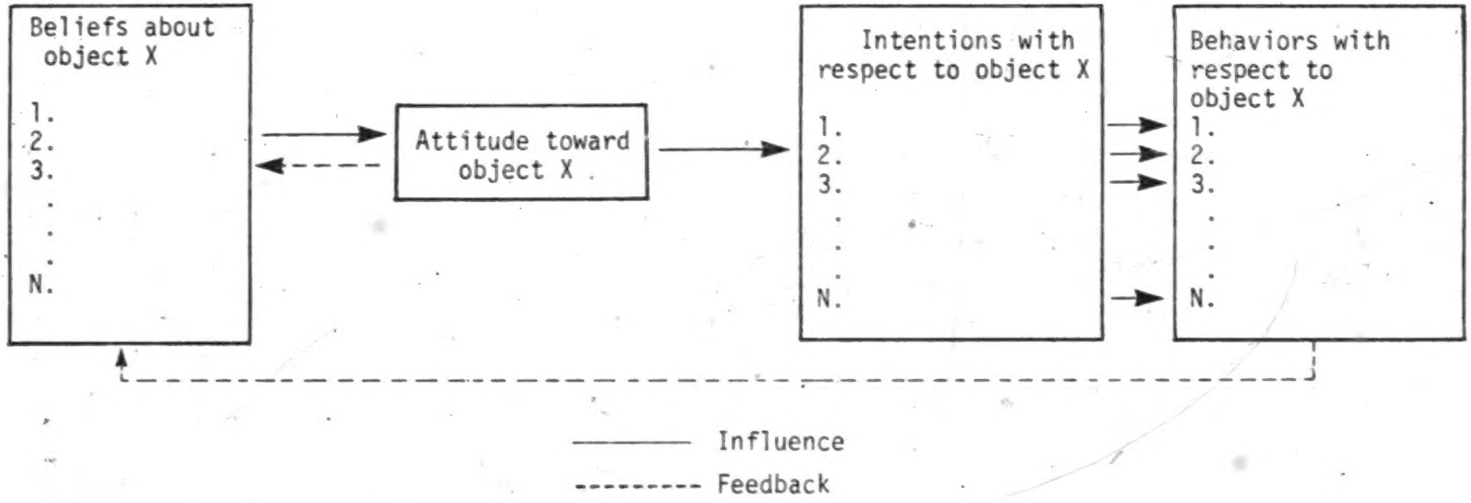
The basic model presented here in a way represents what occurs within an individual in a cognitive fashion. This information processing approach is based on the point of view that man is rational. This model

---

[1] Ibid., pp. 13-16.

Figure 2.1

Conceptual Framework Relating Beliefs, Attitudes, Intentions and Behavior


Beliefs about object X
1.
2.
3.
.
.
.
N.
Attitude toward object X
Intentions with respect to object X
1.
2.
3.
.
.
.
N.
Behaviors with respect to object X
1.
2.
3.
.
.
.
N.
Influence
Feedback

Source: Martin Fishbein and Icek Ajzen, Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research (Reading, Massachusetts: Addison-Wesley Publishing Co., 1975), p. 15.

however is not complete until its formational aspects are considered in somewhat greater detail.

The Broader Theoretical Context

It is the intention of this thesis to link Fishbein's conceptual model to a framework dealing with attitude acquisition. In order to achieve this, some of the basic contributions of the learning theory perspective to the attitude area will be reconsidered. In a manner consistent with earlier learning theory positions, Fishbein agrees that both attitudes and beliefs may be readily placed within the framework of behavior theory.[1]

Maintaining this theoretical basis, attitude acquisition is approached in terms of concept formation. In this approach attitudes are characterized as mediating evaluative responses which are implicitly learned, tending to guide an individual's more overt responses with respect to an attitude object. Here, attitude is unidimensional, concerned only with the amount of affect for or against a psychological object. Also, since every point in semantic space has an evaluative component, an individual can have a positive, negative or neutral attitude with respect to any object, suggesting that there is a mediating evaluative response associated with every stimulus.[2]

Beliefs are characterized in probabilistic terms that a relationship exists between some object and some attribute. If the object of belief is viewed as a stimulus and the attribute or concept related to the belief object is viewed as a response, a belief statement can be seen as a stimulus-response association. Since an individual can associate many different concepts with a given attitude object (object of belief), the totality of an individual's beliefs about an object can be viewed as a belief system. Fishbein calls this system of response a habit-family hierarchy of responses, where the higher the response is in the hierarchy, the greater is the probability that a given response will be associated with the stimulus, and consequently the stronger is the belief.[1] This approach is an adaption of Ramon J. Rhine's theory of concept formation.

---

[1] Martin Fishbein, "A Behavior Theory Approach to the Relations Between Beliefs About an Object and the Attitude Toward the Object," in Readings in Attitude Theory and Measurement, ed Martin Fishbein (New York: John Wiley and Sons Inc., 1967), p. 389.

[2] Ibid.

In terms of Rhine's approach, an attitude is considered to be a concept with an evaluative dimension. A concept is viewed as an association between a common response and a set of stimulu. These associated stimuli often form a class of phenomena which display some types of common characteristics. When many associated stimuli become conditioned to a common mediating response, these stimuli become organized into one system. It is this system of associations between the stimuli and the common mediating response which is the concept. The simplest type of concept can be viewed diagrammatically in Figure 2.2.

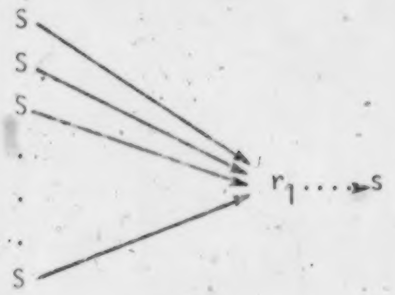
In terms of the following diagram, the simple concept 'grey' would be seen in the following manner. The stimuli (S) would be various shades of color which arouse the same mediating response (r_1) which provides a stimulus conditioned in an individual to the overt verbal label 'grey'.

---

[1] Ibid., p. 390.

Figure 2.2

A First Order Concept



S = stimuli
r_1 = first order mediator
s = stimulus produced by mediator

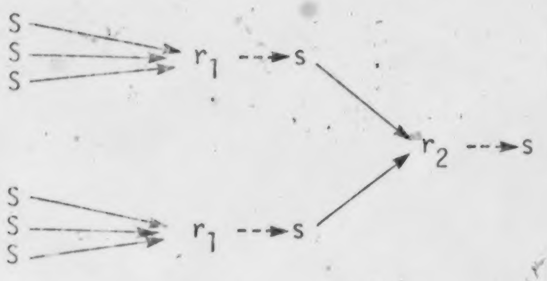
Source: Ramon J. Rhine , "A Concept Formation Approach to Attitude Acquisition," in *Readings in Attitude Theory and Measurement*, ed. Martin Fishbein (New York : John Wiley and Sons Inc., 1967), p. 384.

A more complex situation is one in which different sets of stimuli become associated with different first order mediators, forming first order concepts. The stimuli associated with these first order mediators (s) are themselves associated with another common mediator of the second order. The stimulus produced by this second order mediator forms a second order concept. For example, suppose one set of first order stimuli concerns various types of dress leading to the common mediator of 'uniform', and a second set of stimuli concerning various types of occupational duties leads to the common mediator of 'law control'. Each stimulus is associated with a second order mediator of 'police'. This can be shown in Figure 2.3 on the following page.

According to Rhine, there is no attitude in this second-order concept since there are yet no evaluations involved in concept formation. An attitude developes when at least one of the first order concepts is an evaluative reaction. This implies that attitudes are equivalent to a

Figure 2.3

A Second Order Concept



S = Stimuli (sets leading to 'uniform' and 'law control')

r_1 = mediating first order responses

r_2 = second order mediator

s = stimulus produced by the mediator

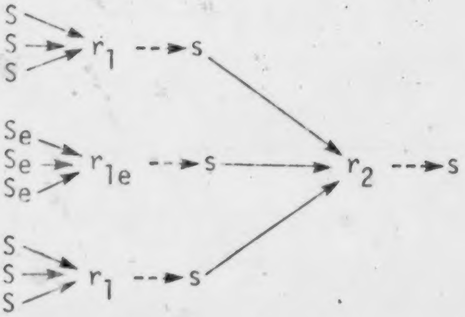
r_2 --► s = concept formed of police

Source: Ramon J. Rhine, "A Concept Formation Approach to Attitude Acquisition," in Readings in Attitude Theory and Measurement, ed. Martin Fishbein (New York: John Wiley and Sons Inc., 1967), p. 384.

special class of concepts distinguished by the inclusion of an evaluative dimension. For example, in order to illustrate a simple attitude, consider the previous example. Suppose that at the first level there is a set of stimuli concerning types of behavior such as 'tough', 'impersonal' and so on, all leading to the common mediator of aggressive. When this set of stimuli becomes associated with the first order concepts, an attitude is formed. This attitude is shown in the figure below.

Figure 2.4

A Simple Attitude



S_e = a group of evaluative stimuli leading to the common evaluative mediators 'aggressive'(r_{1e}).

r_2 = second order concept 'police' with an evaluative aspect now included.

Source: Ramon J. Rhine, "A Concept Formation Approach to Attitude Acquistion," in Readings in Attitude Theory and Measurement, ed. Martin Fishbein (New York: John Wiley and Sons Inc., 1967), p. 384.

Fishbein feels that Rhine's concept formation model carries important implications for studying the relationships between beliefs and attitudes in his own model. If concepts are in fact formed as suggested, then it follows that an individual's beliefs are some function of the learning process. However, Fishbein takes exception to Rhine's point of view that an attitude is not present until at least one of the first order stimuli is evaluative eliciting a first order evaluative mediator. For Fishbein a concept is any discriminal aspect of an individual's world including all stimuli and all responses. In this case all first order stimuli eliciting a common mediator or concept also elicit an evaluative response (be it positive, negative or neutral).[1]

Fishbein sees each of these evaluative responses as being summative. He feels that through the mediation process, the summated evaluative response is associated with the mediator or concept. Thus on future occasions this concept will elicit an evaluative response that is a function of the stimuli that elicit it.

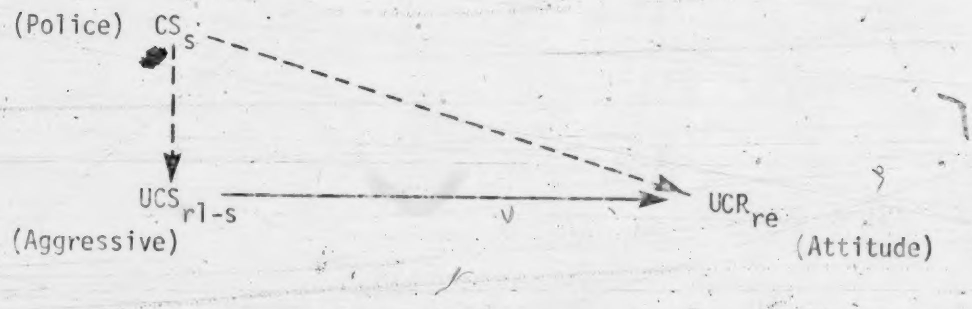
In Fishbein's opinion the summated evaluative response (the attitude) also becomes associated with the concept (stimulus) through the process of classical conditioning. For example, considering only one belief as in the previous example, it can be seen that the evaluative response (that is the UCR or unconditioned response) elicited by the unconditioned stimulus (UCS) 'aggressive' can become associated with the concept 'police' through classical conditioning. In other words, the concept 'police' is the conditioned stimulus (CS). This simple situation can be seen in Figure 2.5 on the following page.

---

[1] Ibid., p. 390-391.

Figure 2.5

Classical Conditioning of an Attitude



Source: Martin Fishbein, "A Behavior Theory Approach to the Relations Between Beliefs About an Object and Attitudes Toward the Object," in Readings in Attitude Theory and Measurement, ed. Martin Fishbein (New York: John Wiley and Sons Inc., 1967), p. 392.

The unconditioned stimulus (i.e., concept of 'aggressive' given by r_{1-s}) elicits the evaluative response. When the conditioned stimulus (i.e., the stimulus concept of 'police') becomes associated with the unconditioned stimulus it begins to elicit the evaluative response before only elicited by 'aggressive'.

Since an individual may have many beliefs about a given concept, the evaluation of each will in part become associated with the attitude object or concept. The evaluation of each related belief available for summation is a function of the strength of the belief (that is, the individual's subjective probability that the stimulus elicits the response).

Once a person has already learned the concept however, he may learn new associations to it which then become a part of and restructure his original habit-family-hierarchy of responses. It is quite possible that after further learning many of the original stimuli originally comprising the formation of the concept are no longer paramount in the response hierarchy. Through conditioning processes and mediated generalization, the introduction of new beliefs (mediated responses) could continually restructure the hierarchy with respect to the attitude object, and consequently the summated evaluation (the attitude itself).[1]

Based on these theoretical considerations, Fishbein has presented a formulation predicting an individual's overall attitude toward an object. Essentially an individual's attitude toward any object is a function of the strength of his beliefs about the object and the evaluative loadings of these beliefs. This relationship can be shown algebraically as follows:[2]

$$A_o = \sum_{i=1}^{N} BiAi$$

where: A_o = attitude toward object o,

Bi = the strength of belief i about o, i.e., the probability or improbability that o is associated with some other concept X_i,

Ai = the evaluative aspect of Bi, i.e., the evaluation of X_i,

N = the number of beliefs about i, i.e., the number of responses in the individual's habit-family-hierarchy.

This formulation is the fundamental building block of Fishbein's theoretical framework. Not only is it important in the theoretical realm, but as will be seen in later chapters, it also carries important implications for attitude measurement.

Through the development of this theoretical framework, it has been proposed that attitudes are acquired in light of behaviorist learning paradigms. If processes such as mediated generalization actually do form attitudes, then the question which remains is how do these processes actually work in real life? Surely, individual attitudes are not developed in sterile laboratory conditions but in the context of day-to-day activities. Thus, it would seem necessary to relate some of these theoretical principles to a more practical model of how attitudes are formed.

---

[1] Ibid., p. 393.

[2] Ibid., p. 394.

Further Considerations in Attitude Formation

An individual's past experiences with his surrounding physical and social environment are the general bases by which social attitudes are formed. This point of view has been familiar to attitude theorists for some time. For instance, in an early writing, Gordon Allport proposed four common conditions for the formation of attitudes. Attitudes may be formed through the accretion of experience or through the integration of a number of specific experiences of a similar type. Through differentiation or segregation, very distinct and specific attitudes may be developed from general attitudes learned in an individual's early years. A dramatic experience or trauma is also thought to be instrumental in forming an attitude. Allport felt that a single experience of this type could actually become the basis of an attitude if it is intense enough to result in a permanent reorganization in the individual's mental field. A fourth condition for attitude formation is what Allport called ready made attitudes. Socialized values and beliefs may be instilled within the individual which may predetermine his attitudes even without the basis of actual experience.[1]

---

[1] The four common conditions of attitude formation can be found in: Gordon Allport, "Attitudes," pp. 810-811.

These early points made by Allport are very similar to some of the more recent writings of William McGuire dealing with attitude formation. McGuire emphasizes the individual's direct experiences with the stimulus or attitude object as being instrumental to attitude formation. Like Allport, he suggests that direct experiences can be in the form of repeated accumulated contacts with the attitude object or in the form of single traumatic or salient events. McGuire continues on to show that there is a substantial body of research supporting these two types of conditions as the bases of attitude formation.[1]

Other theorists have placed greater stress upon indirect rather than direct experience with the attitude object as a basis for attitude formation. Harry Triandis feels that many of our attitudes are learned through communication with other people. Their reports of their experiences and feelings can influence a person's attitude toward some object with which he has never had prior contact.[2] This idea of indirect or vicarious contact with the attitude object corresponds closely to Allport's notion of ready made attitudes based on the influence of other people in our lives.

Martin Fishbein also views the formation of attitudes as being a result of a person's past experiences. The nature of these past experiences lead us to associate 'good' or 'bad' attributes with an attitude object resulting in favorable or unfavorable attitudes. This model of attitude formation is in close correspondence to Fishbein's theoretical model earlier discussed stressing the linkage between beliefs and attitudes.[1] According to this model we automatically acquire an attitude toward an object as we learn its associations with other objects, attributes, or qualities with which we already have attitudes. These attitudes (or evaluations of attributes) were themselves functions of beliefs linking the attribute to other characteristics and the evaluations of those characteristics. According to Fishbein, this chain could continue on indefinitely and ultimately must probably fall back on various primary motives, pleasure-pain principles or hedonism to account for the initial acquisition of affect.[2]

---

[1] McGuire, "The Nature of Attitudes and Attitude Change," pp. 166-167.

[2] Harry C. Triandis, Attitude and Attitude Change (New York: John Wiley and Sons Inc., 1971), pp. 101-102.

This past experience model can be interpreted in terms of the basic conditioning processes of learning theory. When a person is exposed to a stimulus object (either by direct experience or through communication with others), through a number of associations of that object with various attributes, beliefs may be formed. The evaluations of the associated attributes acquired through prior learning are conditioned (either classically or instrumentally) to the stimulus (attitude object), and the evaluation comes to be associated with the stimulus. Thus an attitude toward the object is formed.[3]

Attitudes and Values

The relevance of values to the attitude theory field, in the minds of various social psychologists is quite significant. For instance, Paul Secord and C.W. Backman feel that in a broad sense an individual's entire personality structure and hence his behavior may be thought of as being organized around a central value system comprised of a wide array of related attitudes. In this sense, a value system is seen as an individual's overall orientation toward whole classes of objects.[1] Thus, if values in the broadest sense are considered to be broad groupings of related attitudes, then it would be expected that the study of values would give greater insight into the nature of attitude formation.

---

[1] For a detailed discussion of belief formation, see Fishbein and Ajzen, Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research, pp. 131-215.

[2] Ibid., p. 217.

[3] Ibid., p. 283.

It is Edwin P. Hollander's point of view that values as well as attitudes are acquired through socialization. Attitudes and values are considered as psychological representations of the society's and culture's influence on an individual.[2] Hollander views attitude formation as occurring through direct exposure, indirect exposure and an individual's deep seated personality dispositions including his overall values. Values are defined as core components of a clustering of attitudes, which direct behavior on a long range basis toward some goals in preference to others.[3]

Other theorists view the socialization of attitudes and values as being instrumental in the individual's adult years as well as in childhood. Important aspects of adult socialization are reference and membership groups of the individual. Although a person may learn attitudes and values in his early years, these basic orientations continue to be supplemented or altered by the values implied by the shared perspectives of the groups which play an important role in the individual's interactive life. There has been various research supporting this point of view.[1]

---

[1] Paul F. Secord and C.W. Backman, Social Psychology (New York: McGraw-Hill, 1964), p. 99.

[2] Edwin P. Hollander, Principles and Methods of Social Psychology (2nd ed. New York: Oxford University Press, 1971), p. 147.

[3] Ibid., pp. 149-151.

The theoretical developments of Milton Rokeach will be central in further establishing the relationships between attitudes and values in this study. Because Rokeach's conceptualization of attitudes and beliefs is strongly similar to that of Fishbein's, the consideration of values (as seen by Rokeach) will easily fit into the present theoretical context. Rokeach defines an attitude as, "a relatively enduring organization of beliefs around an object or situation predisposing one to respond in some preferential manner".[2] Also similar to Fishbein, Rokeach feels that based on the principles of learning, attitudes are enduring sets formed by past experiences.

Like Fishbein, Rokeach finds it necessary to distinguish the closely related concepts in his theory in order to help resolve any conceptual confusion which may arise. A belief system represents the total universe of a person's beliefs about the physical and social world and the self. An attitude is an organization of several beliefs (some of which are matters of fact and some of which are evaluative) predisposing one to respond in some preferential manner. A value as distinguished from an attitude is a type of belief centrally located within ones belief system about how one ought or ought not to behave or about end states of existence. Values are abstract ideals which are not tied to any specific attitude representing a person's belief about ideal modes of conduct and terminal goals. In other words, they are a type of standard or criterion for guiding action, developing and maintaining attitudes toward relevant objects, and for justifying one's self.[1]

---

[1] For supportive research on this view see: T. Shibutani, "Reference Groups as Perspectives," American Journal of Sociology, 60 (1955), pp. 562-570 and M. Sherif and C.W. Sherif, Reference Groups: Exploration into Conformity and Deviation of Adolescents (New York: Harper and Row, 1964).

[2] Milton Rokeach, Beliefs, Attitudes and Values: A Theory or Organization and Change (San Francisco: Jossey Bass Inc., 1968), p. 112.

The Proposed Theoretical Model

Having discussed the basic formational and organizational aspects of the proposed theoretical framework for this study, these can be integrated into an overall model. In this model, the earlier formulation linking beliefs, attitudes, intentions and behavior will be organized into a broader framework involving the formational aspects herein discussed. For classification purposes, the formational aspects are divided into direct and indirect contact with the attitude object, depending upon their major type of impact. A diagrammatic view of this model can be seen in Figure 2.6.

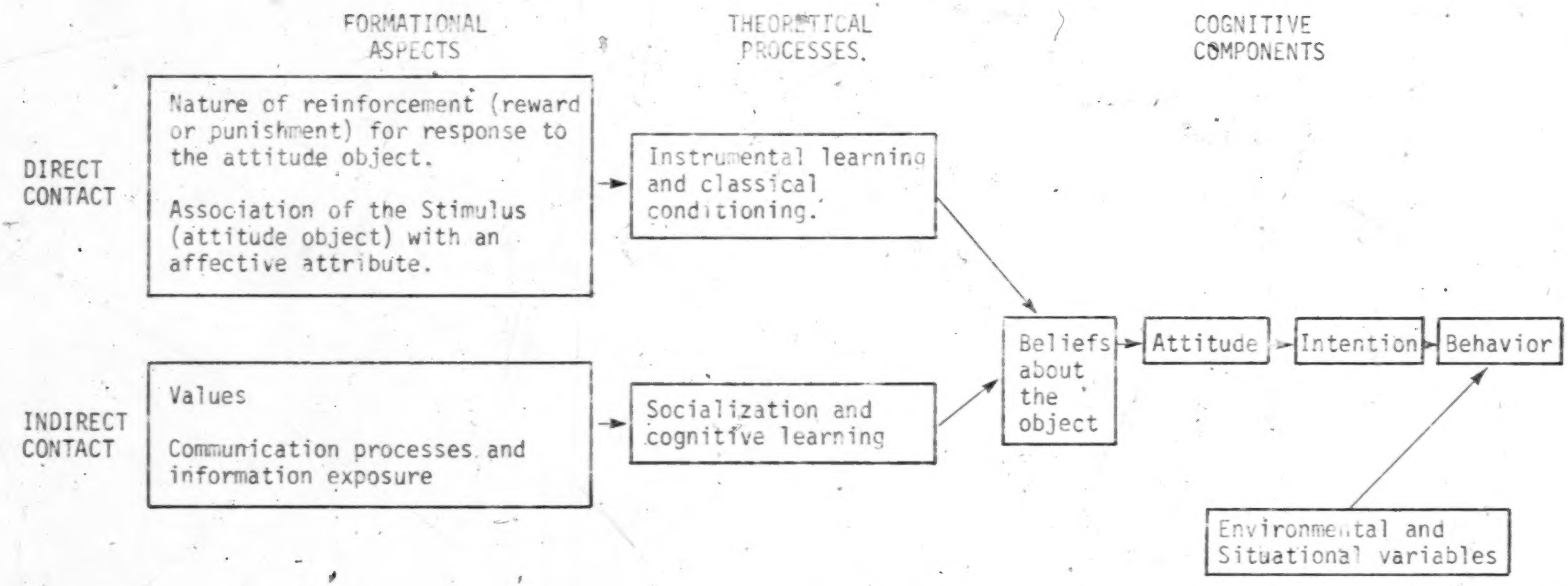
With respect to this model, several points of clarification must be made. Although the basic learning principles (classical and instrumental conditioning) shown are included only within the direct contact classification, this is not to discount their relevance in the establishment of attitudes by means of indirect contact. It was noted earlier in this chapter that values themselves can be thought to be established by way of these same learning processes. However, an adult individual can be expected to have a developed repetoire of basic guiding principles which influence his beliefs and attitudes. Secondly, according to this diagram, the learning principles presented are grouped into one whole. This has been done because when considering an individual's past experiences, it is for all practical purposes impossible to differentiate the

---

[1] Ibid., pp. 123-124, 159-160.

Figure 2.6

The Proposed Theoretical Framework


FORMATIONAL ASPECTS
THEORETICAL PROCESSES.
COGNITIVE COMPONENTS
DIRECT CONTACT
Nature of reinforcement (reward or punishment) for response to the attitude object.
Association of the Stimulus (attitude object) with an affective attribute.
Instrumental learning and classical conditioning.
INDIRECT CONTACT
Values
Communication processes and information exposure
Socialization and cognitive learning
Beliefs about the object
Attitude
Intention
Behavior
Environmental and Situational variables

Major Sources: The above model has been partly derived from the contributions of the following authors: Anthony G Greenwald, "On Defining Attitude and Attitude Theory," in Psychological Foundations of Attitudes, eds. Anthony G. Greenwald, Timonthy C. Brock, and Thomas M. Ostrom (New York: Academic Press, 1968), p. 361.; Martin Fishbein and Icek Ajzen, Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research (Reading, Massachusetts: Addison-Wesley, 1975), p. 15., and Milton Rokeach, Beliefs, Attitudes Values (San Francisco: Jossey-Bass Inc., 1968), pp. 160-164.

exact nature of the learning processes involved. This is in line with the earlier mentioned fact that a classically conditioned stimulus can also have an instrumental or reinforcing function for an individual.

It should also be noted that the formational aspects are shown by arrow to be linked to beliefs and not attitudes. This is because according to the formulation presented by Fishbein, beliefs are the fundamental building blocks for the other related variables. Attitudes it may be recalled, can be considered as hypothetical variables representing the overall summative nature of the total set of salient beliefs about the object. In this sense, belief should be considered as being the variable which is influenced by the presented formational aspects.

Theoretical Hypotheses

From this theoretical model, a series of general theoretical hypotheses can be developed which will help to guide the empirical analyses in later chapters. While these hypotheses are admittedly very broad and perhaps even vague, the variables involved at this point will be later broken down into operational components of a relatively much more specific nature. At this point, these hypotheses can be viewed as a type of summary of the theoretical relationships among the concepts discussed in this chapter.

The first group of hypotheses presented here deal primarily with an individual's direct experience with an attitude object. They will deal with the manner in which the learning principles thus far discussed are expected to influence an individual's attitude. Generally, an individual's present attitude toward an object is some function of his past conditioning history with respect to that object. The relationships involved can be stated in terms of the following hypotheses:

IA There is a positive relationship between the nature of the cumulative quality of an individual's past reinforcement with respect to an attitude object and the favorability of his present attitude toward that object.

IB There is a positive relationship between the nature of a single traumatic or salient experience an individual has with respect to an attitude object and the favorability of his present attitude toward that object.

The second group of hypotheses deal with variables which are thought to be most influential in attitude formation in terms of an individual's previous indirect contact with an attitude object. Here the major points of emphasis are the values a person holds and the relevant attitudes of his peers, relatives and significant others in general. The general expected relationships are given in terms of the following hypotheses:

IIA People with differing value structures will also exhibit systematically differing attitudes toward an object which they are mutually familiar with.

IIB The attitudes of an individual's peers, relatives and significant others toward an attitude object are positively related to the attitudes that the individual holds toward the object.

A third area of investigation concerns the relationships proposed to exist among the variables in the conceptual framework presented in this chapter. An individual's attitude toward an object is expected to be related to the totality of behavioral intentions he has with respect to the object. The expected relationship is given in the following hypothesis:

IIIA The favorability of a person's attitude toward an object is positively related to the favorability of the set of behavioral intentions he has with respect to that object.

CHAPTER III

METHODOLOGY

The Study Area

The geographical area selected for this study is known as Alberta Fish and Wildlife Region Number 7. This region along with six others throughout the province is designed to facilitate the administration of Wildlife Law enforcement. Located in north-central Alberta, Region 7 is further subdivided into the districts of Athabasca, Barrhead, Stony Plain, Edmonton and Vegreville. In each of these subdivisions the district offices provide administrative units for the Wildlife Officers of the area, all of whom are responsible to the Regional Officer in Edmonton.

It is estimated that in 1975 there were approximately 40,000 to 50,000 licensed resident hunters in Region 7 (this estimate was obtained from Fish and Wildlife Division computer tape license data). This is a substantial fraction of the total Alberta Hunter population (there being about 125,000 licensed Alberta hunters in 1975). The region has hunters of both rural and urban backgrounds.

Hunters living within Region 7 find easy access to a variety of upland bird, migratory waterfowl, and big game such as moose, deer and to some extent bear. However, it should be noted that this study does not assume that Region 7 resident hunters hunt solely in that region. The general findings of this study will not only reflect the situation in Region 7, but the attitudes of Region 7 hunters toward Wildlife Officer practices and Wildlife Law administration throughout the province.

Design of the Study

Hunter attitudes toward Wildlife Laws and Officers will be studied by way of an expost facto observation of two hunter groups--known Wildlife Law violators and non-violators. Kerlinger defines expost facto research as a:

> ...systematic empirical inquiry in which the scientist does not have direct control of independent variables because their manifestations have already occurred or they are inherently not manipulable. Inferences about the relationships among variables are made without intervention, from concommitant variation of independent and dependent variables.[1]

This definition suggests various inherent weaknesses in this study as are common to other types of expost facto research. There is no control over time and the study variables. Because the effects of the variables have already occurred at the time of study, causal inferences cannot be made. Thus, as opposed to a true experimental situation, this research will tend to be correlational in nature. In spite of this, it is nevertheless thought that this design is adequate for gaining knowledge of hunters' attitudes at one point in time in a cross-sectional sense. A diagrammatic representation of the research design employed in this thesis is shown in Figure 3.1 on the following page.

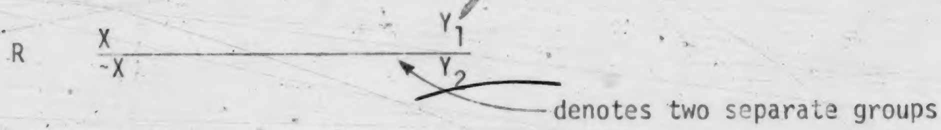
Possible differences in Y_1 and Y_2 cannot be absolutely attributed to the inherent difference (violator-non-violator) of the two hunter groups since there are other factors which could influence differences in attitude. Control of intervening variables can be accomplished by taking into consideration their relationships with the major dependent variable, hunter attitudes. According to attitude theory, various other factors such as the respondents' socio-economic status, demographic background,

---

[1] Fred N. Kerlinger, Foundations of Behavioral Research, 2nd Ed. (New York: Holt, Rinehart and Winston Inc., 1973), p. 379.

Figure 3.1

Design of the Present Study



X: denotes the occurance of a known Wildlife Law violation in 1975 (the known violator),

~X: denotes the non-occurance of a known Wildlife Law violation during 1975 (the non-violator),

Y_1: denotes the assessment of attitudes of known violators,

Y_2: denotes the assessment of attitudes of non-violators,

R : denotes random selection of respondents within groups.

Source: Fred N. Kerlinger, Foundations of Behavioral Research (2nd ed.; New York: Holt, Rinehart and Winston Inc., 1973), p. 321.

socialized values, and quality of contact with Wildlife Officers may have an influence on attitude formation.

Sampling Procedures

The hunter sample was drawn from the population of 1975 residents of Fish and Wildlife Region Number 7. Independent random samples of known violators and non-violators were respectively drawn from the Fish and Wildlife Division's 1975 violation records and computer tape license data. A hunter violator in this study is defined as one having a record of a 1975 Wildlife Law violation. It is possible that some hunters in the non-violator sample were undetected violators in 1975 or were known violators from previous hunting seasons. However, this was not controlled for in the research design. The extent to which this possibility may influence results will be commented upon in the latter part of this chapter.

In the early stages of the research, a pilot study was administered to a small sample of hunters for the purpose of pretesting the questionnaire and research design. From the above sources, fifty known violators and seventy non-violators were randomly selected. The total pretest response after one mailing of the questionnaire was 35.1%. This was deemed an acceptable amount for the preliminary purpose for which the data were gathered. Upon completion of the pretest, the actual study sample was drawn. From the hunter population, independent random samples of violators and non-violators yielded a total sample size of 1,182 (136 violators and 1,046 non-violators). The first mailing of the questionnaire to this sample yielded a combined response rate of 39.0%. After approximately one month, a second mailing of the questionnaire to all non-respondents increased the total combined response rate to 57.7%. Table 3.1 on the following page shows in greater detail the response trends of first, second and total mailings for both hunter groups.

Although the total response rate was 57.7% after two mailings, the proportion of usable returns was somewhat less. Some questionnaires were returned unanswered due to wrong addresses or not having been completed by respondents. Of 1,182 questionnaires mailed out, 596 returned usable comprising a usable overall response rate of 50.4%. While this response is comparable to those of similar studies cited in Chapter I, the fact that nearly half of the original sample did not respond cannot be overlooked. To investigate the possibility of return bias, respondents from first and second mailings were compared over various background characteristics. The second mailing respondents can be considered as non-respondents had only one questionnaire mailing been performed. Any bias

Table 3.1

Response Trends of Questionnaire Mailouts

	Number Mailed Out	Number Completed	Unusable Returns	Percent Return
FIRST MAIL				
Violators	136	37	9	33.8
Non-Violators	1046	358	57	39.7
Total Hunters	1182	395	66	39.0
SECOND MAIL				
Violators	90	18	2	22.2
Non-Violators	631	183	18	31.9
Total Hunters	721	201	20	30.7
TOTAL MAILS				
Violators	136	55	11	48.5
Non-Violators	1046	541	75	58.9
Total Hunters	1182	596	86	57.7

trends should thus be revealed by differences in the first and second mailing respondents.

The two respondent groups were compared for the variables: residence, age, secondary education, seasons hunted and violation status. The null hypothesis under test for each variable was that there was no difference in the characteristic under study for the two respondent groups. Using a .05 significance level, the following tables summarize the statistical results concerning the two respondent groups.

Table 3.2

Residence of First and Second Mailing Respondents

	Rural Farm	Rural Non-Farm	Urban	Row Total
First Mailing	24	52	314	390
Second Mailing	14	18	168	200
Column Total	38	70	482	590

NOTE: Missing observations = 6

χ^2 = 2.44 (2 d.f.)

Significance = .296

Table 3.3

Age of First and Second Mailing Respondents

	N	$\bar{X}^*$	T Value	Significance
First Mailing	394	34.72	-.51	.611
Second Mailing	199	35.29		

* average age in years.

NOTE: Missing observations = 3

Table 3.4

Secondary Education of First and Second Mailing Respondents

	N	$\overline{X}$*	T Value	Significance
First Mailing	392	10.97	1.58	.115
Second Mailing	199	10.73		

* average education in years.

NOTE: Missing observations = 5

Table 3.5

Seasons Hunted of First and Second Mailing Respondents

	N	$\overline{X}$*	T Value	Significance
First Mailing	393	13.77	.67	.505
Second Mailing	199	13.13		

* average years hunted.

NOTE: Missing observations = 4

Table 3.6

Violation Status of First and Second Mailing Respondents

	Violators	Non-Violators	Row Total
First Mailing	37	358	395
Second Mailing	18	183	201
Column Total	55	541	596

NOTE: Missing observations = 0

x^2 = .00021 (1 d.f.)

Significance = .9884

In each case, the significance level of the calculated statistics does not exceed the .05 level. The null hypothesis for each variable is not rejected and it is concluded that there are no differences between first and second mailing respondents in terms of the characteristics studied. It is assumed that the remaining non-respondents would likely not display significant differences from the study sample. This assumption is confirmed in an analysis concerning a comparison of the sample and hunter population undertaken in Appendix B of this thesis. In that analysis no significant differences were found for the age and sex distributions between the hunter population and study sample.

Construction of the Survey Instrument

Sociological Facts

The first part of the questionnaire which hunters received concerned facts regarding their socio-economic and demographic backgrounds. The variables such as age, sex, marital status, residence, education, occupation, income, hunter training, and hunting experience were included because of their potential influence on the attitudinal variables. The quantification and sub-classification of these variables does not present any serious problems as they are widely used in many types of social survey research. The major concern in operationalizing these variables was to present them in such a way so as to enable subsequent comparative analysis with other studies or with the general Alberta population. With this consideration in mind, the categorical breakdowns for each of these variables was either identical or compatible with data and questions in the 1971 Canadian Census. Background variable breakdowns can be viewed in questions 1 through 10, 16, 17 and 21 of the questionnaire in Appendix A.

Perceptual Variables

Overall experiences with Wildlife Officers-- The actual amount and nature of experiences which hunters had with Wildlife Officers was an important aspect of this research. Based on the theoretical considerations in Chapter II, a substantial aspect of attitude formation was proposed as a result of the nature of an individual's direct experiences with the attitude object. To obtain a measure of Officer contact, hunters were asked to record the amount of times they had actually encountered a Wildlife Officer while hunting for each of the hunting seasons during 1973, 1974 and 1975.[1] Contacts with Officers prior to 1973 were not asked since it was thought that hunter estimations would become less accurate.

Having obtained a measure of actual contacts a measure of the quality of contacts was obtained. Hunters were asked to indicate the extent to which Officers generally tended to display a series of listed behavioral characteristics. The characteristics listed for rating purposes were: fair, suspicious, respectful, polite, authoritarian, efficient, and arrogant. Hunters rated the extent to which Officers displayed each characteristic on a five-point scale.[2] Responses to the behavioral characteristic ratings were scored in such a manner that the more Officers were perceived to display a positive behavior or the less they were perceived to display a negative behavior, the higher the score. When all the ratings are summed, the higher the overall score, the more favorable would be the hunter's overall experiences with Wildlife Officers.

---

[1] The method of estimating hunter contacts with Wildlife Officers over the three year period is illustrated in question 18 of the questionnaire in Appendix A.

[2] The rating alternatives for the quality of overall contact measure can be found in question 20 of the questionnaire in Appendix A.

Behavioral intentions-- For both Wildlife Laws and Officers, hunters were asked how they thought they would behave by checking one of six ordinally ranked alternatives. One set of intention alternatives was developed for each attitude object. Alternatives in each case were listed from the most favorable to the most unfavorable allowing hunters' intentions to be ranked in relation to one another.[1]

Values-- The empirical work of Milton Rokeach was applied to obtain a measure of hunters' hierarchical value structure.[2] The original methodology included two value systems of eighteen values each (instrumental and terminal values). Respondents were asked to rank the values in each system from 1 to 18. In applying this methodology to this study, only the instrumental value system was used. Given the length of the questionnaire in the present study, hunters were instead asked to rate each value on a five point range of importance.[3] By doing this, it would not be possible to obtain individual rankings since a respondent could attribute equal amounts of importance to each value listed in the scale. However, group averages for each value could be used to obtain overall group rankings of the listed values.

Hunters' perceptions of significant others' attitudes-- In Chapter II it was proposed that a person's reference and membership groups would be influential in determining the nature of his own attitudes. In consideration of this, hunters were asked their perceptions of their significant others' general attitudes (those who hunt) toward Wildlife Laws and Wildlife Officers. Two questions were included in the questionnaire, one pertaining to each attitude object regarding the favorability of significant others' attitudes.[1] Very favorable general attitudes were given a score of 5 and very unfavorable ones were given a score of 1.

---

[1] See questions 14 and 15 of the questionnaire in Appendix A for the measures of behavioral intentions.

[2] Rokeach, Beliefs, Attitudes and Values, pp. 156-178.

[3] See question 11 of the questionnaire in Appendix A for the manner in which values were measured.

Measurement of Attitudes

Hunter attitudes toward Wildlife Laws and Wildlife Officers were measured according to Likert's method of summated ratings.[2] This method allows the respondent to rate a number of statements or items on a five point scale ranging from strongly disagree to strongly agree. This thesis utilized conventional scale construction techniques in the field of attitude measurement.

Initially, large pools of statements were collected concerning each attitude object. Both item pools contained approximately fifty items, each having roughly equal amounts of clearly positive or negative statements. In developing these two item pools, previous research employing similar scales was consulted.[3] The two item pools were formed into scales and included in the pretest questionnaire. Pretest responses to the attitude scale items were scored in such a fashion that the more favorable the response, the higher the score. This necessitated that strong agreement with a positive statement and strong disagreement with a negative item received a score of 5. Scores of 1 were attributed in exactly the opposite fashion. This type of scoring procedure ensured that once all item scores for the scale were summed, the higher the total score, the more favorable the overall attitude.

---

[1] See questions 22 and 23 of the questionnaire in Appendix A for significant others' attitudes.

[2] R. Likert, "A Technique for the Measurement of Attitudes," in Archives of Psychology, Vol. 22 (1932), pp. 1-55.

[3] Shaw and Wright, Scales for the Measurement of Attitudes, pp. 249-264, 447-451; Patrick T. Cleaver, et al., "Gradients in Attitudes Toward Law, Courts and Police," in Sociological Focus, Vol. 2, No. 2 (1968), pp. 29-39; Gene E. Carte, "Changes in Public Attitudes Toward the Police: A Comparison of 1938 and 1971 Surveys," in Journal of Police Science and Administration, Vol. 1, No. 2 (June 1973), pp. 224-231.

Pretest responses were used to perform an item analysis. This procedure helped to ensure that all those attitude statements which were to be included in the final questionnaire met the criterion of internal consistency.[1] According to this criterion, the more favorable a person's attitude, the more likely he should endorse positive statements and the less likely he should endorse negative ones. To determine whether the attitude scale items met this criterion, all the respondents' scores for each item were correlated with their respective total scale scores by using the Pearson Correlation Coefficient. Item analysis yielded approximately 100 correlation coefficients. Only those items having the highest correlations with their total scale scores were selected. Twenty-four statements were utilized in each final scale.

The selected items were listed in the questionnaire in the form of two attitude scales.[2] Respondents were again asked to indicate their extent of disagreement or agreement with each statement. Overall attitude scores for each respondent were obtained by summing all the item values in the scale. A more detailed discussion concerning the development of a Likert scale and its relationship to theory as presented in this thesis is found in Appendix C.

---

[1] A.N. Oppenheim, Questionnaire Design and Attitude Measurement (New York: Basic Books Inc., 1966), pp. 138-140.

[2] The two attitude scales can be seen in questions 12 and 13 of the questionnaire in Appendix A.

Limitations of the Study

As was stated earlier in this chapter, this study is subject to the general weaknesses of expost facto design. Kerlinger summarizes the problems associated with this type of design as being: 1) the inability to manipulate independent variables, and 2) the risk of improper interpretation.[1] The first problem has already been discussed and brief consideration will be given to the second. Improper interpretation in expost facto research results from the possibility of a variety of alternative explanations in a given situation. Relationships found among certain variables may be interpreted in a causal manner when in fact they could merely be spurious in nature. Although there is no ultimate safeguard from this problem the validity of interpretation increases if analyses are guided by logical hypotheses. It is hoped that following such a procedure in this thesis will render the explanation of any found relationships more plausible.

Another aspect of weakness in this study concerns the definitions of known violater and non-violator hunters. Violators were defined as those having records of Wildlife Law violations during the 1975 season. Although none of the non-violator sample hunters had this type of record in 1975, it is possible that members of this group could have been violators from earlier hunting seasons or are current violators who have not been caught. It is generally implausible to determine the actual universe of Wildlife Law violators due to practical consideratons.

A more material problem would be considering the possible effects on results of some 1975 non-violators being known violators from earlier hunting seasons. It could be argued that respondents of this nature might tend to conform more to 1975 violator response trends rather than trends of non-violators (given that there actually are systematic differences in the two groups). However, this type of tendency would likely de-emphasize known violator non-violator differences rather than accentuate them.

---

[1] Kerlinger, Foundations of Behavioral Research, p. 390.

Another limitation concerns the controversy regarding the quantifiability of Likert scale data. It is widely accepted that the Likert measurement technique produces ordinal data. This would be a limitation only in the sense of the types of statistical analyses which could be performed with this type of data. Contrasting positions are currently being expressed in the literature regarding the applicability of parametric techniques in the analysis of Likert scale data. Based upon some previous research, the position taken in this thesis is that quantitative statistics may be used for ordinal data in a limited sphere of applicability. Following is a summary of research which supports this viewpoint.

Allen Edwards is of the opinion that Likert attitude scores cannot be interpreted independently of the distribution of scores for some defined group. Lack of knowledge of a zero or neutral midpoint on the scale renders assessment of individual attitude favorability difficult. This however, is viewed as a handicap only if the researcher's major interest is to assign on the basis of an attitude score a single respondent to the class of favorable or unfavorable attitude toward the object in question. If however, the researcher's interest is to compare average change in attitudes as a result of introducing some experimental variables or to compare mean attitude scores of two or more groups, this may be done without reference to any actual zero point.[1]

---

[1] Edwards, Techniques of Attitude Scale Construction, pp. 156-157.

Other authors similarly judge Likert measurement as yielding interval data in a narrow sense. Bert Green has indicated that the Method of Summated Ratings can be said to provide an interval scale although it has these properties only in terms of the population attitude distribution.[1] Sellitz and others speaking of social science measurement in general, indicate that there is considerable disagreement as to whether ordinal or interval levels of measurement are most appropriate for most social science measurement techniques.[2] They state that some social scientists view certain measurement techniques such as attitude scales as proper interval scales. Still others have taken the position that although most measurements used do not go beyond the ordinal level, little harm is done in applying to them statistics requiring interval data. Sellitz continues on to state that interval statistics are widely used in the analysis of social science data with or without the assumption that the data actually meet the requirement of such scales.

Richard Boyle has conducted empirical research dealing specifically with the problem of using quantitative statistical techniques on ordinal data. It was his finding that a major obstacle in bridging the gap between theory and statistical analysis in sociology is the requirement of interval data. He attacked this problem initially by investigating what can go wrong theoretically when interval scales are assumed. He then presented a technique (dummy variables) for checking on the results of assuming equal intervals in data and then applied the technique. His conclusion was that the empirical dangers in assuming equal intervals are not great and that more concentrated effort in this area could lead to improvements in sociological measurement.[1]

---

[1] Bert Green, "Attitude Measurment," in Handbook of Social Psychology, Vol. I, Ed. Gardner Lindzey (Cambridge, Mass: Addison-Wesley Pub. Co., 1954), p. 364.

[2] Claire Sellitz, et al., Research Methods in Social Relations (New York: Holt, Rinehart and Winston, 1959), p. 196.

If these points of consideration can be accepted, the quantifiability of Likert scale data is not a major limitation at all. Quantitative statistics will be employed (eg. Student's t test) when comparing the attitude favorability among two sample sub-groups. Relative differences in favorability are the only aspects of interest and no isolated judgements of attitude favorability will be made. When analyzing relationships between the attitude variables and other hypothesized related variables, nonparametric techniques will be applied.

The remainder of this thesis will be concerned with statistically analyzing operational forms of the theoretical hypotheses of Chapter II. The chapter immediately following will consider the sample characteristics with a brief analysis of violator non-violator differences. The remaining chapters will specifically deal with testing direct and indirect factors in attitude formation.

---

[1] Richard P. Boyle, "Path Analysis and Ordinal Data," American Journal of Sociology, Vol. 75, No. 4, Part 1 (Jan. 1970), p. 461.

CHAPTER IV

HUNTER CHARACTERISTICS

The purpose of this chapter is to present the general hunter sample characteristics. Based upon information gained from questionnaire responses, analysis of the socio-economic and demographic variables considered in this study for violators, non-violators and total hunters will be presented. Accompanying each table is a statistical summary of violator non-violator differences. Depending upon whether the variable under study is quantitative or categorical, either Student's t test or Chi Square is applied.[1] In each case the null hypothesis is one of no difference among the two hunter groups. The significance level chosen for all analyses is .05.

Sample and Subsample Profiles

Age

The average age for all sampled hunters is 34.9 years with approximately 55% being younger than the average. The non-violator age distribution closely parallels that of the total sample, however known violators are more concentrated in the younger age categories. Respective average ages for violators and non-violators are 29.9 and 35.4 years. Approximately 57% of the violators were under the age of 29, while only 39% of the non-violators fall into this category. Table 4.1 on the following page indicates that the difference in average ages between these two hunter groups is significantly different at greater than the .05 level.

---

[1] The use of Student's t test is done with reference to: Hubert M Blalock, Jr., Social Statistics (2nd ed.; New York: McGraw-Hill Book Co., 1972), pp. 222-228. Chi Square and Spearman correlation analysis is done with reference to: S. Siegel, Non-Parametric Statistics for the Behavioral Sciences (New York: McGraw-Hill Book Co., 1956), pp. 104-111, 202-211. All statistical analyses in this thesis are done on the S.P.S.S. computer program package available at the University of Alberta.

Table 4.1

Age Distribution of Hunters

Age Group (Yrs)	Violators Freq.	Pct.	Non-Violators Freq.	Pct.	Total Freq.	Pct.
10-14	0	0	2	0	2	0
15-19	11	20	51	10	62	11
20-24	10	19	61	11	71	12
25-29	10	18	95	18	105	17
30-34	7	13	79	14	86	15
35-39	7	13	50	10	57	10
40-44	3	6	70	13	73	12
45-49	2	4	57	10	59	10
50-54	2	3	30	6	32	5
55-59	1	2	20	4	21	4
60-64	1	2	13	2	14	2
65-69	0	0	6	1	6	1
70-74	0	0	3	1	3	1
75-79	0	0	2	0	2	0
TOTAL	54	100	539	100	593	100
Average	$\bar{X} = 29.9$		$\bar{X} = 35.4$		$\bar{X} = 34.9$	

$t = -3.03$

Sig. = .003

Sex

A high proportion of the sampled hunters (96.6%) were male. There were no females in the violator group and 4% in the non-violator group. Results of the χ^2 test indicate that the sex differences between these two groups is not significant at the .05 level (Table 4.2).

Table 4.2

Sex of Hunters

Sex	Violators Freq.	Violators Pct.	Non-Violators Freq.	Non-Violators Pct.	Total Freq.	Total Pct.
Male	55	100	517	96	572	96.6
Female	0	0	20	4	20	3.4
TOTAL	55	100	537	100	592	100

$\chi^2 = 1.133$

Sig.= .2872

Marital Status

The majority of all hunters (71.3%) were married at the time the survey was undertaken. Differing trends in marital status were however exhibited for violators and non-violators. Approximately 52% of the violators were married and 74.2% of the non-violators fell into this category. It was also indicated that violators had roughly double the proportion of single respondents than non-violators (44.4% as compared to 22.8%). Statistical analysis (χ^2) showed that the differences in marital status for these two groups were significant at greater than the .05 level (Table 4.3).

Table 4.3

Marital Status of Hunters

	Violators		Non-Violators		Total	
	Freq.	Pct.	Freq.	Pct.	Freq.	Pct.
Single	24	44.4	122	22.8	146	24.8
Married	28	51.9	397	74.2	425	72.1
Separated	0	0	3	0.6	3	0.5
Divorced	2	3.7	12	2.2	14	2.4
Widowed	0	0	1	0.2	1	0.2
TOTAL	54	100.0	535	100.0	589	100.0

$x^2 = 12.745$*

Sig. = .0017

* This result obtained by collapsing Separated, Widowed and Divorced into one categroy.

Residence

The majority of the total hunter sample (81.7%) reside in urban areas. Violators indicate somewhat lower proportions than non-violators for this category (69.1% and 83.0% respectively). Greater proportions of violators come from rural farm and non-farm areas (30.9%) than non-violators (17%). Chi Square analysis indicated that the differences in residence for these two hunter groups are significant at greater than the .05 level (Table 4.4).

Education

The majority of both hunter groups (52.7%) have at least a grade twelve education (Table 4.5). Proportionately fewer violators than non-violators continued their education in a post-secondary institution. For those hunters

Table 4.4

Residence of Hunters

Residence*	Violators Freq.	Violators Pct.	Non-Violators Freq.	Non-Violators Pct.	Total Freq.	Total Pct.
Rural Farm	7	12.7	31	5.8	38	6.4
Rural Non-Farm	10	18.2	60	11.2	70	11.9
Urban	38	69.1	444	83.0	482	81.7
TOTAL	55	100.0	535	100.0	590	100.0

* Respondents were classified as rural farm or non-farm if they lived in a population centre with less than 1,000 population. Farm and non-farm classifications depend upon the respondents' major source of income. Urban is classified as a population centre of more than 1,000.

$x^2 = 6.962$

Sig. = .0311

that did continue their education after grade twelve non-university institutions such as trade and technical schools were more common (Table 4.6). Combining the total years of education (secondary and post secondary) it is shown that average total years differs somewhat between violators and non-violators ($\overline{x}$ = 11.76, 12.51 years respectively, from Table 4.6). Student's t test indicates that this difference is significant at greater than the .05 level (Table 4.6).

Income

Almost half (43.8%) of the sampled hunters reported annual household incomes ranging between $10,000 and $20,000. Trends for violators and non-violators are similar as 44.3% and 43.7% fall into this income range. Chi Square results indicate that the difference in annual income among

Table 4.5

Secondary Education of Hunters

Education (Yrs)	Violators Freq.	Violators Pct.	Non-Violators Freq.	Non-Violators Pct.	Total Freq.	Total Pct.
Less than 6	1	1.8	2	0.4	3	0.5
6	0	0	6	1.1	6	1.0
7	0	0	6	1.1	6	1.0
8	3	5.5	46	8.6	49	8.3
9	6	10.9	46	8.6	52	8.8
10	12	21.8	63	11.8	75	12.6
11	10	18.2	79	14.7	89	15.1
12	22	40.0	262	48.9	284	48.1
13	1	1.8	26	4.8	27	4.6
TOTAL	55	100.0	536	100.0	591	100.0

Table 4.6

Post Secondary Education of Hunters

Education (Yrs)	Violators University	Violators Non-University	Non-Violators University	Non-Violators Non-University	Total University	Total Non-University
	(%)	(%)	(%)	(%)	(%)	(%)
0	81.8	76.4	78.6	62.8	78.8	64.1
1	5.5	3.6	2.6	10.1	2.9	9.4
2	3.6	10.9	2.4	11.2	2.5	11.2
3	7.3	0	2.8	6.2	3.2	5.6
4	0	9.1	6.3	9.7	5.8	9.7
5	1.8	--	2.6	--	2.6	--
6	0	--	4.7	--	4.2	--
	N = 55	N = 55	N = 536	N = 535	N = 591	N = 590

$\overline{X}$ Violators = 11.76 yrs.*

$\overline{X}$ Non Violators = 12.51 yrs.*

t = -2.05

Sig. = .044

* Averages for both violators and non-violators were determined by combining years of secondary and post secondary education to determine total years of education.

violators and non-violators is not significant at the .05 level (Table 4.7).

Table 4.7

Income of Hunters

Income ($)	Violators Freq.	Violators Pct.	Non-Violators Freq.	Non-Violators Pct.	Total Freq.	Total Pct.
0 - 4,999	3	5.8	19	3.7	22	3.9
5,000 - 9,999	8	15.3	53	10.3	61	10.8
10,000 - 14,999	12	23.1	105	20.5	117	20.8
15,000 - 19,999	11	21.2	119	23.2	130	23.0
20,000 - 24,999	7	13.5	101	19.7	108	19.1
25,000 - 29,999	5	9.6	50	9.7	55	9.7
30,000+	6	11.5	66	12.9	72	12.7
TOTAL	52	100.0	513	100.0	565	100.0

$\chi^2 = 2.898$

Sig. = .8215

Occupation

Occupations associated with the majority of all respondents (51%) were managerial, technological, construction and transport equipment operating (Table 4.8). The occupation of greatest proportion for violators was construction (24.4%) while for non-violators it was managerial (20%). On the whole, non-violators tended to dominate the 'white-collar' types of occupations (managerial, medicine, teaching, etc.), while violators were more prominent in construction, primary, machine operating etc. occupations. Dividing the occupations into the two broad categories of 'white collar' and 'blue collar'. Chi Square analysis shows the occupational differences among violators and non-violators to be significantly different at greater than the .05 level (see Table 4.8).

Table 4.8

Occupation of Hunters

Occupation	Violators Freq.	Violators Pct.	Non-Violators Freq.	Non-Violators Pct.	Total Freq.	Total Pct.
Managerial	4	8.2	94	20	98	18
Teaching	0	0	28	6	28	5
Medicine	0	0	9	2	9	2
Technological	2	4.1	34	7	36	7
Clerical	0	0	13	3	13	2
Sales	7	14.3	33	7	40	8
Service	6	12.2	42	9	48	9
Farming	3	6.1	27	5	30	6
Other Primary	3	6.1	4	1	7	1
Processing	0	0	15	3	15	3
Machinery	4	8.2	31	6	35	7
Construction	12	24.5	84	17	96	18
Transport	5	10.2	40	8	45	8
Other	3	6.1	28	6	31	6
TOTAL	49	100.0	482	100	531	100

$\chi^2 = 5.589$*

Sig.= .0181

* This χ^2 figure was obtained by collapsing the occupational categories into two broad divisions. Managerial to Sales were labelled 'White Collar' and Service to Transport were labelled 'Blue Collar'. 'Other' responses were divided similarily.

Hunting Experience

Hunters as a whole indicated they hunted for an average of 13.6 years although a large proportion (45%) hunted for less than 10 years. Violator and non-violator groups showed differing trends in hunting experience as 42% of the violators report hunting less than 5 years while only 24% of the non-violators fell into this category. Average years of hunting for violators and non-violators respectively were 10.2 and 13.9. Student's t test results indicate that the difference in average years hunted is significantly different at greater than the .05 level (Table 4.9).

Hunter Training

Most hunters (72.4%) received their hunter training from their fathers or other experienced hunters. Approximately 10% of all hunters had some type of formal training. Violators and non-violators show similar trends in training although proportionately more violators report some type of formal training (12.7% as compared to 9.5%). Chi square analysis shows the differences in training for these two are not significant at the .05 level (Table 4.10).

Hunting Companionship

Friends and relatives were the most common companions of the sampled hunters, as over 90% indicated their preferences in these two areas. Although there are some proportionate differences between violators and non-violators in companionship preferences, results are generally similar. Chi square results indicate there is no significant difference (.05) in the companionship preferences of these two groups (Table 4.11).

Table 4.9

Hunting Experience

Seasons Hunted	Violators Freq.	Violators Pct.	Non-Violators Freq.	Non-Violators Pct.	Total Freq.	Total Pct.
0 - 4	23	42	130	24	153	26
5 - 9	13	23	103	19	116	19
10 - 14	5	10	80	15	85	15
15 - 19	3	5	64	12	67	11
20 - 24	4	7	59	11	63	11
25 - 29	3	6	37	6	40	7
30 - 34	3	5	34	6	37	6
35 - 39	0	0	10	2	10	1
40 - 44	1	2	12	3	13	2
45 - 49			4	1	4	1
50 - 54			0	0	0	0
55 - 59			1	0	1	0
60 - 64			3	1	3	1
TOTAL	55	100	537	100	592	100
Average (Years)	$\overline{X} = 10.2$		$\overline{X} = 13.9$		$\overline{X} = 13.6$	

t = -2.37

Sig.= .018

Table 4.10

Hunter Training

Training	Violators Freq.	Violators Pct.	Non-Violators Freq.	Non-Violators Pct.	Total Freq.	Total Pct.
Formal	7	12.7	51	9.5	58	9.9
Father	18	32.8	166	31.0	184	31.2
Others	23	41.8	221	41.3	244	41.3
Myself	7	12.7	97	18.2	104	17.6
TOTAL	55	100.0	535	100.0	590	100.0

$X^2 = 1.393$

Sig. = .7071

Table 4.11

Hunting Companionship

Companionship	Violators Freq.	 Pct.	Non-Violators Freq.	 Pct.	Total Freq.	 Pct.
Relatives	18	35.3	192	36.2	210	35.9
Friends	31	57.4	287	54.0	318	54.4
Work Assoc.	2	3.7	27	5.1	29	5.9
Guide	0	0	2	0.4	2	0.3
Alone	3	5.6	23	4.3	26	4.5
TOTAL	54	100.0	531	100.0	585	100.0

x^2 = .7679

Sig. = .9427

Association Membership

Approximately 41% of the sampled hunters had at one time or another belonged to some type of Fish and Game Association. Violators were proportionately more likely than non-violators to ever belong to this type of organization (41.8% and 40.8% respectively). Chi square analysis shows that the differences in membership patterns for the two hunter groups are not significant at the .05 level (Table 4.12).

Hunter Profile Summary

Region 7 resident hunters are predominantly male, averaging about 35 years of age. The majority are married and live in urban areas. Most hunters obtained a grade twelve education and if they went to a post secondary institution, it was usually a technical, trade or business school rather

Table 4.12

Association Membership of Hunters

Membership	Violators Freq.	Violators Pct.	Non-Violators Freq.	Non-Violators Pct.	Total Freq.	Total Pct.
Yes	23	41.8	219	40.8	242	40.9
No	32	58.2	318	59.2	350	59.1
TOTAL	55	100.0	537	100.0	592	100.0

χ^2 = .00002

Sig. = .9961

than a university. Hunters tend to fall into the middle income brackets and hold managerial, technological, construction or transport occupations. They have hunted for an average of 13.5 years and most likely received their hunter training from their fathers or other experienced hunters. The majority of hunters hunt with friends or relatives and about 40% belong or once belonged to some type of Fish and Game Association.

Known violators and non-violators were found to differ in a number of respects. Student's t tests or χ^2 tests were applied to determine whether any differences in background variables for these two groups were statistically significant at the .05 level. Significant differences were found for age, marital status, residence, education, occupational type and hunting experience. Violators are significantly younger than non-violators and more prone to be either single or divorced. Significant proportions of violators over non-violators tend to live in rural areas and hold 'blue collar' types of occupations. Violators also have less total years of education and hunting experience than their non-violator counterparts.

CHAPTER V

ANALYSIS OF FACTORS WHICH DIRECTLY OR INDIRECTLY INFLUENCE ATTITUDE FAVORABILITY

This chapter presents the empirical analysis of the relationships among variables as hypothesized in Chapter II. According to the theoretical framework developed in this study, social attitudes are formed as a result of two general conditions. Direct experience with the attitude object in the form of single salient events or accumulated experiences can serve as a basis of attitude formation. It was also expressed that attitudes can be formed without actual direct contact with the attitude object. A person's socialized values for example, may serve as a basis for predetermining his attitudes. The analysis in this chapter will proceed according to these general areas of influence.

Direct Contact with the Attitude Object.

It was proposed in Chapter II that an attitude object has the ability to positively or negatively reinforce the attitude of an individual who has come in contact with it. An examination of generalized conditioning principles led to the hypothesis that the nature of an individual's contact with an attitude object is directly related to the favorability of his attitude toward that object. With respect to this, it was proposed that there are two types of actual experiences an individual may have with an object which may influence the favorability of his attitude. Accumulated experiences are cognitively evaluated by the individual to form an overall attitudinal assessment of the attitude object. Aside from this, a single isolated experience with the attitude object may also significantly influence attitude formation. If an individual has had a salient or dramatic experience with some object, it could become the major basis upon which his attitude toward that object is assessed regardless of the evaluative nature of the overall related experiences.

The Salient Experience

Hypothesis IA presented earlier in this thesis stated that there is a positive relationship between the nature of a single traumatic or salient experience an individual has with respect to an attitude object and the favorability of his present attitude toward that object. Although it has been stated that an individual's overall experiences with an object is a determining factor in the formation of his attitude toward that object, an isolated experience might serve as a basis for determining attitude if it is of great enough salience to the individual.[1]

With respect to this, it is proposed that the Wildlife Law violation situation is an incident of such salience in the mind of a hunter. In essence then, the theoretical hypothesis under test is that the violation situation is a salient experience resulting in differing attitudes among hunters. Since the salient experience is hypothesized to be positively related to attitude favorability, it is thought that the violation experience is one which is of sufficiently negative quality to result in attitudes of lesser favorability.

The salient experience hypothesis can be operationalized into various components for empirical analysis. The violation situation is expected to be related to both attitudes toward Wildlife Laws and Officers among hunters. Given the nature of the violation situation, it is expected that known violators will have less favorable attitudes than non-violators toward both attitude objects.

---

[1] Supporting the salient experience as a basis for attitude formation are: Allport, "Attitudes," pp. 810-811, and McGuire, "The Nature of Attitudes and Attitude Change," pp. 166-167.

Total score attitude trends for the two hunter groups were considered to determine whether distributions corresponded to the hypothesized differences. Figures 5.1 and 5.2 illustrate total attitude score distributions of violators and non-violators in terms of each attitude object. These graphical presentations show score distributions in the context of the possible range of total scores (from 24 to 120). Proportion of hunters is plotted against total scores to obtain a graph which indicates total score trends. Figure 5.1 illustrates violator non-violator Wildlife Law attitude scores. Medians for violators and non-violators are 84,00 and 87.48, respectively. A similar distribution in Figure 5.2 illustrates violator, non-violator attitude toward Wildlife Officer scores. Median scores for the two groups are 80.00 and 87.69, respectively.[1]

Both figures indicate that violator score distributions are less favorable than those of the non-violators, supporting the hypothesized trend. To determine whether these differences were statistically significant, Student's t test was applied to analyze the mean score differences for the two groups. A separate t test was performed for Wildlife Law and Wildlife Officer attitude differences among violators and non-violators. In each case, the null hypothesis was that violator average scores are equal to non-violator average scores ($\overline{X}_1 = \overline{X}_2$). The alternative hypothesis to be accepted at the .05 significance level is that the violator average scores are less than non-violator average scores ($\overline{X}_1 < \overline{X}_2$).

---

[1] These scores are determined by considering only those returned questionnaires in which all attitude items were answered. Since total scores are used, non-responses for one or more items would result in a downward bias reflecting a less favorable attitude than may actually be true. All subsequent analyses concerning total attitude scores use only fully completed attitude scale responses. The differing sample sizes reported in the following analyses are a result of the application of this procedure.

Figure 5.1

Violator /Non-Violator Wildlife Law Attitude Scores

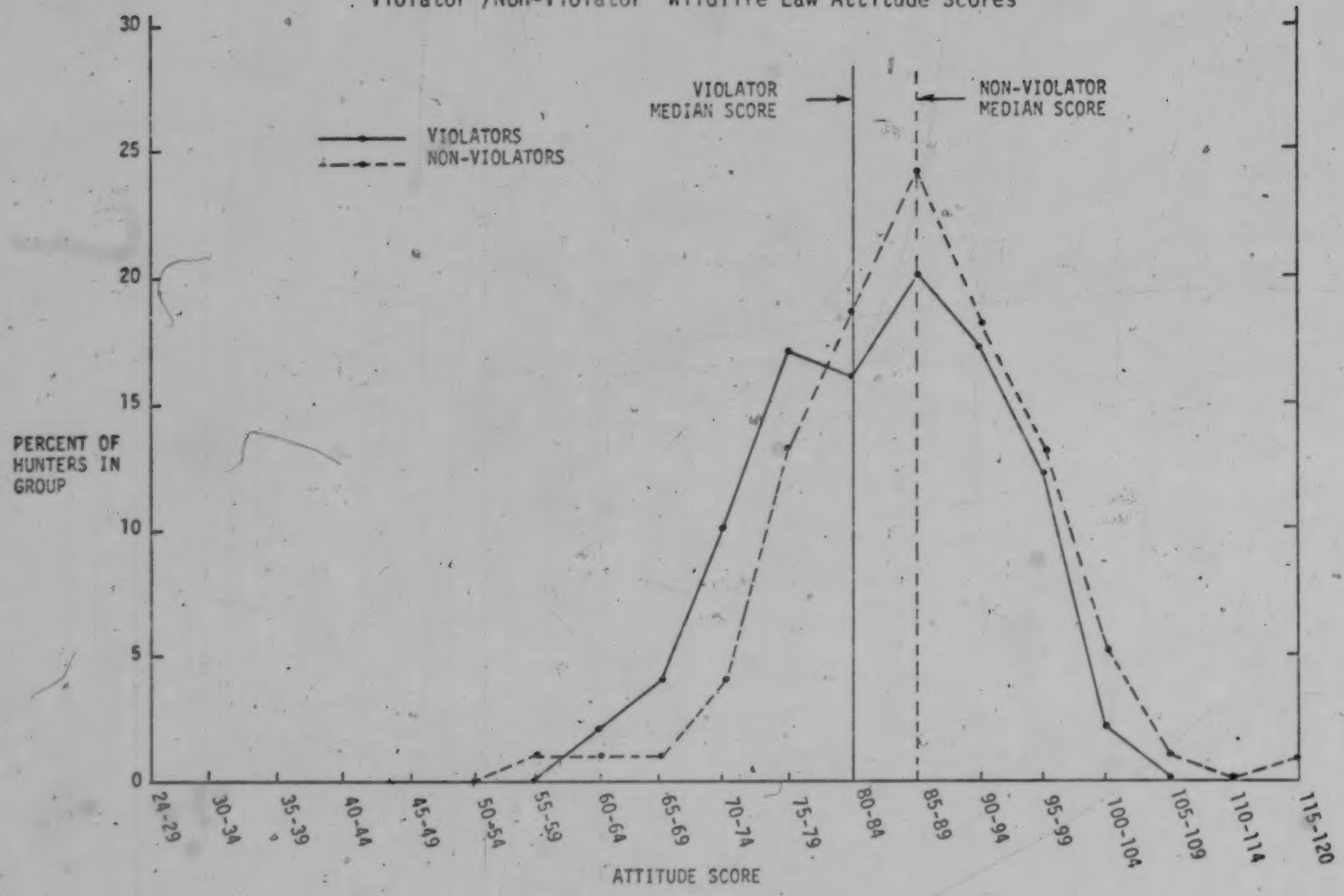


Figure 5.2

Violator/Non-Violator Wildlife Officer Attitude Scores

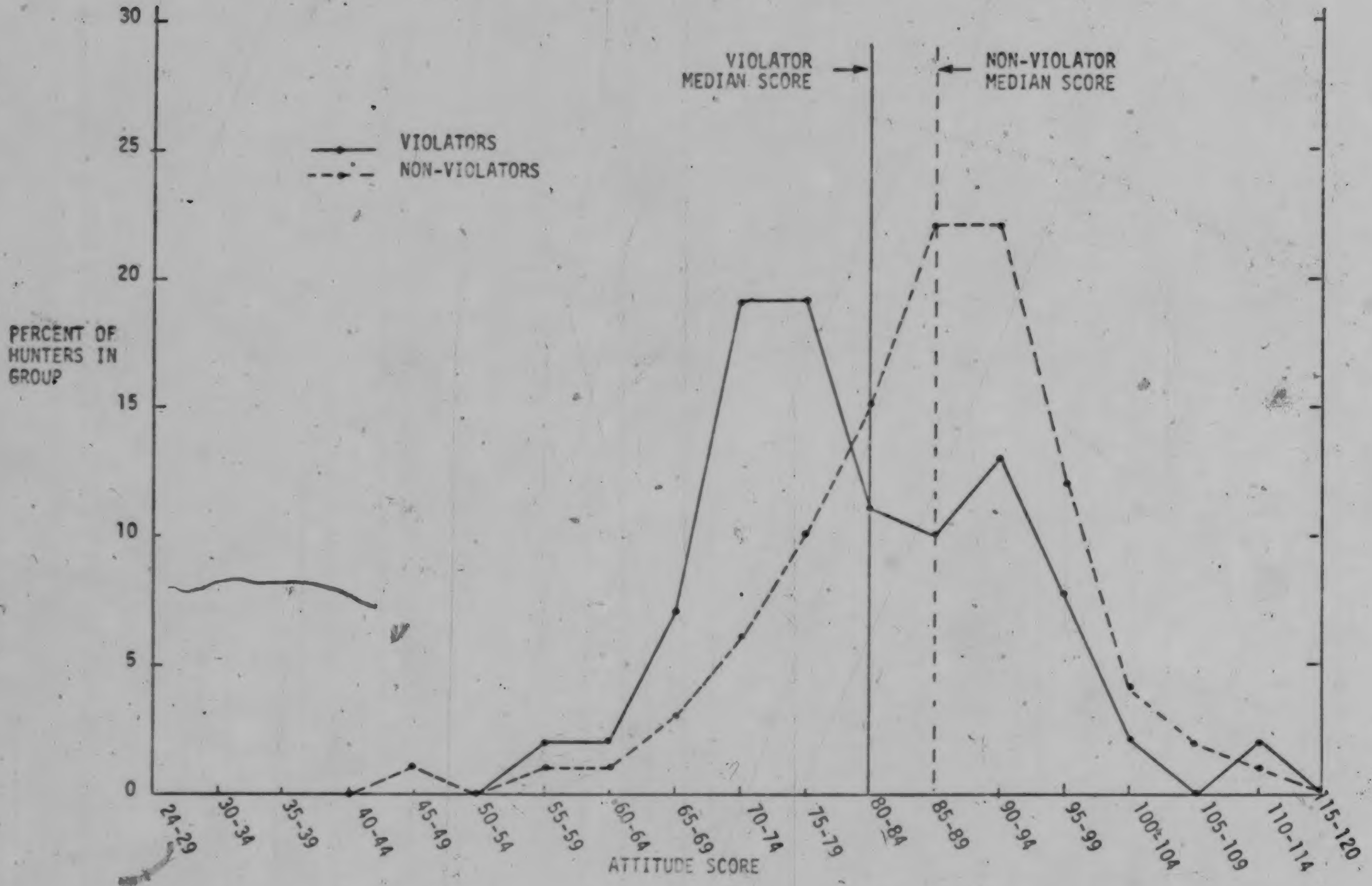


Table 5.1 summarizes the results of the t tests for the Wildlife Law and Officer attitude scores of violators and non-violators. Both t values were significant at greater than the .05 level and the null hypothesis in each case is rejected. It is concluded that the violation situation is a sufficiently salient situation to result in significantly different attitudes toward Wildlife Laws and Officers among known violator and non-violator hunters. Results indicate that violator attitudes are significantly less favorable than non-violator attitudes toward Wildlife Laws and Officers.

Table 5.1

Difference of Means Tests for Violator/
Non-Violator Attitude Scores

		N	$\overline{X}$	T-Value	Significance
Wildlife Law Attitudes	Violators	51	83.92	-2.37	.018
	Non-Violators	515	87.20		
Wildlife Officer Attitudes	Violators	53	81.66	-3.17	.002
	Non-Violators	504	86.48		

Overall Experiences with the Attitude Object

Hypothesis IB (Chapter II) stated, there is a positive relationship between the nature of the cumulative quality of an individual's past reinforcement with respect to an attitude object and the favorability of his present attitude toward that object. It was proposed that an individual's past overall quality of contact with respect to an object may be reflected by his perceptions of the quality of his experiences with the object. If the experiences are generally seen as favorable, the individual should display a positive attitude and vice versa. Ratings of Officer behavior are seen as the individual's reflection of his overall experiences.[1]

The theoretical hypothesis can be operationalized into several components. Since the Wildlife Officer is the primary conveyor of Wildlife Law to the hunter it is expected that positive relationships should exist between both Wildlife Law and Wildlife Officer attitudes and overall quality of contact with Wildlife Officers. To test these relationships, violators and non-violators were grouped into one sample and total attitude scores were correlated with overall contact scores. The Spearman Rank Order Correlation (r) was used to test the correspondence of score favorability among hunters between attitudes and contacts with Officers.[2] In terms of hypothesis IB, positive correlations were expected between attitude scores and quality of contact~~scores~~. The null hypothesis for each test was that $r = 0$, or in other words there is no linear relationship between hunters' rankings on attitude scores and their rankings on overall quality of Officer contact scores. The alternative hypothesis to be accepted at the .05 probability level was that there is a positive relationship between the rankings ($r > 0$). The statistical results are summarized in Table 5.2.

The test results indicate a significant positive relationship exists between attitude favorability toward Wildlife Laws and Officers and overall quality of contact with Wildlife Officers. The null hypothesis in each case is rejected in favor of the alternative $r > 0$. However, since

---

[1] See page 51 for a discussion of the rating procedure.

[2] The Spearman Rank Order Correlation is applied in reference to: Sidney Siegel, Non-Parametric Statistics for the Behavioral Sciences (New York: McGraw-Hill Book Co., 1956), pp. 202-213.

Table 5.2

Correlations of Wildlife Law and Wildlife Officer Attitudes with Quality of Contact with Wildlife Officers

	Quality of Contact		
	Spearman r	Significance	N
Wildlife Law Attitudes	.3451	.001	386
Wildlife Officer Attitudes	.6322	.001	382

the significance of the Spearman r test is to a large extent a function of sample size, greater attention is given to the actual strength of the relationship rather than significance levels.[1] The correlations of Wildlife Law and Wildlife Officer attitudes with overall quality of contact are moderately positive.[2] Reviewing the correlation coefficients in Table 5.2 it can be seen that quality of contact with Wildlife Officers has a greater positive association with attitudes toward Wildlife Officers than with attitudes toward Wildlife Laws.

In terms of hypothesis IB, one other aspect of analysis concerns the overall experiences with Wildlife Officers among known violators and and non-violators. From the hypothesis, it was expected that violators would exhibit different quality of contact with Officers than non-violators. In order to test this, overall contact scores were compared for the two groups by using the t test. The null and alternative hypotheses were $\overline{X}$ violators = $\overline{X}$ non-violators and $\overline{X}$ violators < $\overline{X}$ non-violators. Results of this test are presented in Table 5.3.

---

[1] The formula for testing the significance of Spearman r is given in Siegel, *Non-parametric Statistics for the Behavioral Sciences*, p. 212 as: $t = r\sqrt{(N-2)/(1-r^2)}$. As N (sample size) becomes sufficiently large even weak correlations yield significance.

[2] Interpretation of correlation coefficients is given in J. Levin, *Elementary Statistics in Social Research* (New York: Harper and Row Publishers, 1973), p. 209.

Table 5.3

Comparison of Overall Quality of Officer Contact for Violators and Non-Violators

	N	$\overline{X}$	T-Value	Significance
Violators	44	22.50	-4.60	.000
Non-violators	355	26.02		

The results indicate that the calculated t value was significant at greater than the .05 level and thus the null hypothesis is rejected. It was concluded that violators have had significantly less favorable overall experiences with Wildlife Officers than non-violators. This concludes the analysis of direct contact influence on attitude favorability. Findings in this area indicate that both the salient experience and overall experiences are related to attitude favorability among hunters.

Indirect Contact with the Attitude Object

It is the belief of several authors in the attitude field that an individual can develop an attitude toward an object without ever actually having contact with it.[1] This section will investigate factors which are hypothesized to influence attitudes in this manner. Expected aspects of influence are an individual's values acquired through socialization and the attitudes of his significant others. Analysis of these proposed areas of influence will proceed individually through the operationalization of hypotheses IIA and IIB presented in Chapter II.

---

[1] Allport, "Attitudes," pp. 810-811, and Triandis, Attitude and Attitude Change, pp. 101-102.

Values

The theoretical considerations in Chapter II (pages 35-38) led to the hypothesis that people with differing value structures will exhibit systematically differing attitudes toward an object which they are mutually familiar with. Since values are assumed a function of the individual's social environment, it is hypothesized that the types of values an individual holds most important are related to his socio-economic and demographic background. Values are also hypothesized to be related to attitudinal differences among hunters. In this sense, it is expected that those background variables which are related to differences in value structure among hunters will also be related to differences in attitude favorability toward Wildlife Laws and Officers.

To first test the hypothesis that socio-economic and demographic differences among hunters are related to differences in value structure dichotomization of each background variable used in the analysis was performed. Violators and non-violator hunters were combined into one sample and reclassified for each of the background variables considered in the manner shown in Table 5.4.

Using the value scale included in the questionnaire, importance rankings were obtained for each dichotomized hunter group within each variable considered. Average responses for each value in the scale were obtained for each subgroup.[1] Values were then ranked from most to least important according to each dichotomized subgroup's average value scores. For each background variable, value rankings were then correlated for the contained subgroups using the Spearman Rank Order test. The null and alternative hypotheses under test were that there is no linear relationship between the rankings of each subgroup ($r = 0$) and that there is a linear relationship between value rankings ($r \neq 0$).

---

[1] Responses to the value scale (question 11 of the questionnaire in Appendix A) were scored from 1 to 5 according to degree of importance given to each value. Subgroup averages for each value were then ranked from 1 to 18 (highest to lowest average scores).

To accept the hypothesis that a particular background variable is related to differences in value structure among hunters, there would have to be a result of no linear correlation ($r = 0$) or a significant negative correlation ($r < 0$) among hunter sub-group value rankings. If a significant positive correlation resulted ($r > 0$), it would be concluded that there is a degree of direct association in the value rankings indicating the background variable under study is not related to differences in value structure among hunters.

Table 5.4 on the following page summarizes the correlations between value rankings for each dichotomized background variable. Based on the .05 level of significance, all reported correlations are significantly greater than zero. This result indicates that none of the background variables are related to differences in value structure among hunters. In fact the general trends among hunters were to rank values such as honest, responsible and self-controlled high and imaginative and intellectual low in importance.

It was expected that those background variables related to differences in value ranking would also be related to differences in attitude favorability among hunters. Since it has been shown that values do not differ among hunters of different socio-economic and demographic backgrounds, the upcoming analysis concerning background variables and attitude

Table 5.4

Value Ranking Correlations for Background Variable Sub-Groups

Variables	Sub-Groups	Correlation (r)	Significance
Age	Under 30 30 and over	.868	.001
Sex	Male Female	.610	.01
Marital Status	Single Married	.827	.001
Residence	Rural Urban	.907	.0001
Education	Up to Grade 12 Over grade 12	.903	.0001
Income	$0 - $14,999 $15,000+	.930	.0001
Occupation	White Collar Blue Collar	.833	.001

favorability cannot be considered as being reflective of differences in value structure among hunters.

To test the relationships between background variables and attitude favorability, the same dichotomized classifications used in the prior analysis were applied. Student's t test was used to determine whether mean attitude scores for the sub-groups within each background variable were significantly different. A separate series of t-tests was performed for Wildlife Law and Wildlife Officer attitudes of hunters. The null hypothesis under test was that for each background variable the average attitude scores of the subgroups are not significantly different ($\overline{X}_1 = \overline{X}_2$). This null hypothesis was to be rejected at the .05 probability level in favor of the alternative $\overline{X}_1 \neq \overline{X}_2$.

Table 5.5 summarizes the relationships between background variables and Wildlife Law attitude favorability. The only variable associated with a significant difference in attitude favorability was residence. Rural hunters showed significantly less favorable attitudes toward Wildlife Laws than urban hunters. The remainder of the variables were not related to differences in Wildlife Law attitudes among hunters.

Table 5.5

Background Variable Relationships With Wildlife Law Attitude Favorability

Characteristic	Groups	N*	$\overline{X}$**	T-Value	Significance
Age	Under 30 30 and Over	234 297	87.05 86.98	.09	.932
Sex	Male Female	512 19	86.87 90.68	-1.73	.085
Marital Status	Single Married	135 393	87.53 86.78	.79	.431
Residence	Rural Urban	94 435	84.46 87.51	-2.84	.005
Education	Grade 12 or Less Over Grade 12	296 238	87.23 86.69	.65	.519
Income	\$0 - \$14,999 \$15,000+	180 327	85.88 87.33	-1.68	.094
Occupation	White Collar Blue Collar	207 273	86.96 86.99	-0.04	.968

* denotes size of hunter sub-group used in t-test.

** denotes average sub-group Wildlife Law attitude score.

The relationships between background variables and Wildlife Officer attitudes are shown in Table 5.6. Age and residence were the only variables showing significant differences in Wildlife Officer attitude favorability. Hunters under the age of 30 or of rural residence showed less favorable attitudes toward Wildlife Officers than hunters over 30 or of urban residence. The dichotomized groups within the remaining variables did not show significant differences in attitude toward Wildlife Officers.

Table 5.6

Background Variable Relationships with Attitudes Toward Wildlife Officers

Characteristics	Groups	N*	$\bar{X}$**	T-Value	Significance
Age	Under 30 30 and Over	234 297	84.82 86.78	-2.16	.031
Sex	Male Female	512 19	85.76 89.15	-1.37	.172
Marital Status	Single Married	135 393	85.70 85.90	-0.19	.849
Residence	Rural Urban	94 435	83.04 86.43	-2.81	.005
Education	Grade 12 or less Over Grade 12	296 238	86.18 85.53	.70	.484
Income	$0 - $14,999 $15,000+	180 327	84.76 86.30	-1.60	.110
Occupation	White Collar Blue Collar	207 273	85.62 86.41	.79	.429

* denotes number of hunters in groups.

** denotes average attitude toward Wildlife Officer score.

Value structure was subsequently tested for its relationships with attitude favorability among hunters. To test the hypothesis that differences in value ranking are related to differences in attitude favorability among hunters, total attitude score distributions for each attitude object were divided at their respective medians. For each attitude score distribution hunters were either labelled as having "low" or "high" attitudes depending upon their position with respect to the median. Value rankings were then determined for low and high attitude hunters with respect to each attitude object.

The Spearman r was used to test the relationships between value rankings of low and high attitude hunters. Null and alternative hypotheses under test were r = 0 and r ≠ 0 respectively. Table 5.7 summarizes the relationships for both attitude score distributions.

Table 5.7

Value Ranking Correlations for Hunters of Differing Attitude Favorability

	Groups	Spearman r	Significance
Wildlife Law Attitudes	low high	.944	.0001
Wildlife Officer Attitudes	low high	.958	.0001

Results in both cases indicate nearly perfect positive relationships between the value rankings of low and high attitude hunters which are significant at greater than the .05 level. The null hypothesis is rejected; however the theoretical hypothesis that differences in attitude favorability among hunters are related to differences in value structure is not supported. Results indicate close correspondence in value rankings regardless of attitude favorability of hunters.

Attitudes of Significant Others

A further source of hypothesized indirect influence on attitude favorability is the attitude of significant others. Based on theoretical considerations in Chapter II, hypothesis IIB proposed that the attitudes of an individual's peers, relatives and significant others toward an attitude object are positively related to the attitudes that the individual holds toward the object.

Hunter ratings of their significant others' general attitudes toward Wildlife Laws and Officers were obtained. Influence upon hunter attitudes from significant others was expected to be reflected by positive correlations between the attitude favorability of the two groups. Spearman Rank Order correlation was applied to test the correspondence in attitude favorability rankings with respect to each attitude object for hunters and their significant others. For each test the null and alternative hypotheses concerning the attitude favorability rankings of the two groups are $r = 0$ and $r > 0$ respectively. Results of these tests are shown in Table 5.8.

Table 5.8

Correlations of Hunter Attitudes with Significant Others' Attitudes

	Groups	Spearman r	Significance	N
Wildlife Law Attitudes	Hunters Sig. Others	.1568	.001	368
Wildlife Officer Attitudes	Hunters Sig. Others	.4327	.001	368

Results from Table 5.8 indicate that the attitudes of hunters and significant others are significantly related (based on a .05 probability level). Wildlife Law attitudes for these two groups exhibit a weak positive correlation. The relationship between Wildlife Officer attitudes for these two groups is somewhat stronger, indicated by a moderate positive association. It is concluded that the attitudes of hunters and their ratings of their significant others' general attitudes are positively related.

Further exploration in this area concerns the relationships between hunters and their significant others on a behavioral level. Known violator and non-violator hunters were compared with significant others' Wildlife Law violations by crosstabulating the violation status of the two groups. To test the null hypothesis that hunter violation status is independent of significant others' violation status, the Chi Square test was applied.

Results from Table 5.9 on the following page indicate that the obtained χ^2 value of 89.26 is significant at greater than the .05 level. The null hypothesis is rejected and it is concluded that the violation status of hunters is related to the violation status of significant others. Hunter violators were significantly more likely to know a friend or relative who had violated Wildlife Law than non-violator hunters. The general findings in this section indicate that there is some possibility of indirect influence on hunter attitudes from the attitudes of significant others.

Attitudes and Intentions

The theoretical considerations of Martin Fishbein discussed in Chapter II led to the development of a conceptual framework relating belief,

Table 5.9

Crosstabulation of Hunter and Significant Other Wildlife Law Violation Status

Violation Status of Hunters	Violation Status of Significant Others			
	Yes	No	Don't Know	Row Total
Violator	23	24	8	55
Non-Violator	27	440	69	536
Column Total	50	464	77	591

$X^2 = 89.26$ 2 d.f.

Sig.= .0000

Missing Observations = 5

attitudes, intentions and behavior. Intentions were proposed to be a special class of beliefs in which the object is always the person himself and the attribute is some associated behavior. Attitude toward an object was considered to be related to the individual's total set of behavioral intentions with respect to the object but not necessarily to any specific intention.

Hypothesis IIIA of Chapter II stated; a person's attitude toward an object is positively related to his behavioral intentions with respect to that object. It is expected that the favorability of a hunter's attitudes toward Wildlife Laws and Officers are positively related to the general favorability of his behavioral intentions with respect to these attitude objects. To test the hypothesis of positive association between attitude and intention rankings among hunters, Spearman Correlation was applied. Null and alternative hypotheses under test were $r = 0$ and $r > 0$, respectively. Results of the correlations concerning both attitude objects are shown in Table 5.10.

Table 5.10

Correlations of Hunter Attitudes with Intentions

	Groups	Spearman r	Significance	N
Wildlife Laws	Attitude Intention	.1531	.002	369
Wildlife Officers	Attitude Intention	.2754	.001	369

Based on the .05 level of significance, it is concluded that there is indication of positive correlation between attitudes and intentions with respect to Wildlife Laws and Officers. The correlations however, are weak-positive suggesting only slight correspondence between rankings of the two variables. It is thought that this result is due to only having considered one general intention with respect to each attitude object. It was previously mentioned that attitudes are related to the set of an individual's intentions with respect to an object but not necessarily to any one intention. It is likely that the single measure of intention used in this study was not as accurate as a selection of related intentions would have been. The directionality of the predicted relationship was confirmed however, and in light of the theoretical framework used in this thesis, more intense analysis of hunters' intentions might have yielded stronger correlations.

CHAPTER VI

MULTIVARIATE ANALYSIS OF DIRECT AND INDIRECT INFLUENCE ON ATTITUDE FAVORABILITY

Statistical analysis to this point in this thesis has been bivariate in nature. The hypothesized relationships among the study variables with attitudes were tested independently of the possible effects of other variables. Although this gives insight into the nature of the relationships, bivariate analysis cannot reveal the component explanatory powers of the variables on attitude variation simultaneously. In an attempt to assess the combined effects of the explanatory variables on attitude favorability, a least squares regression model is applied.[1] In the framework of this thesis multiple regression may give indication of the overall explanatory power of the presented theoretical model and show which variables are most prominent in explaining attitudinal variation.

In applying the multiple regression model here, only those variables found to be significantly related to attitudinal variation in Chapter V are considered. These variables are violation status, overall quality of contact with Wildlife Officers, age, residence and attitudes of significant others. The relationships which exist between these independent variables and the attitude variables are stated in the following functional forms:

$WLAT = f(E1, QUALCON, AGE, D1, Sa, U)$

$WOAT = f(E1, QUALCON, AGE, D1, Sa, U)$

where: WLAT = Wildlife Law Attitude,

WOAT = Wildlife Officer Attitude,

---

[1] M. Dutta, Econometric Methods (Cincinnati: South-Western Publishing Co., 1975), pp. 30-71.

E1 = Residence,
QUALCON = Quality of contact with Wildlife Officers,
AGE = Age in years,
D1 = Violation Status,
Sa = Significant others' attitude,
U = Unexplained variation.

The least squares regression equations which can be stated from these functional forms are:

$$WLAT = B_o + B_1E1 + B_2QUALCON + B_3AGE + B_4D1 + B_5Sa + U$$

$$WOAT = B_o + B_1E1 + B_2QUALCON + B_3AGE + B_4D1 + B_5Sa + U$$

In order to apply the regression model to the questionnaire data, two dummy variablies had to be constructed for the categorical variables presented in the relationship. Variable D1 is a dummy variable constructed for violation status. If a hunter is a known violator, D1 = 0 and for all non-violators, D1 = 1. A second dummy variable E1 is developed for residence. For all hunters of rural farm and non-farm classifications, E1 = 0. For all urban hunters, E1 = 1. By assigning these arbitrary values to violation status and residence, these nominal variables may be applied directly in the regression analysis.

Subprogram Regression available in the S.P.S.S. computer package was used to regress the five independent variables on each dependent attitude variable.[1] The stepwise inclusion option available in this subprogram was implemented in order that the independent variables are introduced into the regression equation in descending importance. Separate regression models will be developed and tested for each dependent variable WLAT and WOAT.

---

[1] Jae-On Kim and Frank J. Kohout, "Multiple Regression Analysis; Subprogram Regression," in Statistical Package for the Social Sciences, eds. Norman H. Nie, et al., (2nd ed.; New York: McGraw-Hill Book Co., 1975) pp. 320-367.

In reporting the regression results, the regression coefficients, their standard errors and t values, multiple R, R^2 and the F value for R^2 will be reported at each level of stepwise inclusion of the independent variables.

Wildlife Law Attitudes

The subprogram used in this regression analysis supplies simple correlations among all variables used in the analysis. This output is useful for intuitive interpretion of the presence of multicollinearity among the independent variables. If two or more independent variables are highly collinear, it may become very difficult to disentangle their separate influences on the dependent variable and obtain a reasonably precise estimate of their relative effects.[1] Simple correlations among variables are viewed in order to determine whether multicollinearity is a problem. Table 6.1 shows the correlation matrix for all included variables in the Wildlife Law attitude (WLAT) regression.

Table 6.1

Correlation Matrix for Specified
Variables in WLAT Regression

	WLAT	QUALCON	Sa	AGE	D1	E1
WLAT	1.00	.40763	.16938	-.03154	.08514	-.09844
QUALCON		1.00	.14234	.11523	.21606	.10479
Sa			1.00	.08295	-.06824	-.00632
AGE				1.00	.18295	-.08025
D1					1.00	.05355
E1						1.00

---

[1] Dutta, Econometric Methods, pp. 142-158.

Viewing Table 6.1, the correlation coefficients of 1.00 down the principle diagonal simply indicate the correlation of a particular variable with itself. Values below the diagonal are not reported since the matrix is symmetrical about the diagonal. The only correlation of reasonable strength is QUALCON with WLAT, and since this correlation concerns the dependent variable, there is no cause for concern. The remainder of the correlation coefficients are very low indicating that there is little liklihood of the presence of multicollinearity in the model.

Table 6.2, on the following page shows the results of the stepwise regression of the chosen independent variables on Wildlife Law attitudes. The independent variables are listed from left to right in the order which they have been included in the regression model. For each stepwise inclusion, associated with the independent variables are the regression coefficients (B), their standard errors (S.E.) and t values associated with the coefficients (t). The t value is a significance test concerning whether the regression coefficient is significantly greater than zero. The t value is given by the formula:[1]

$$t = \frac{\hat{B} - B}{S_{\hat{B}}}$$

where $\hat{B}$ = estimate of the coefficient,

B = expected value of the coefficient,

$S_{\hat{B}}$ = standard error of $\hat{B}$.

Under the null hypothesis that $B = 0$, the formula becomes:

$$t = \frac{\hat{B}}{S_{\hat{B}}}.$$

---

[1] Ibid., p. 94.

If the obtained t value is significant with N-1 degrees of freedom at a two-tailed probability of .05, the null hypothesis is rejected and it is concluded that B is significantly different from zero.[1]

The regression results in Table 6.2 indicate that the coefficients for the two independent variables QUALCON and Sa are consistently greater than zero for each stepwise inclusion level. The coefficients for the remainder of the variables are not significantly different from zero, thus these variables are to be withdrawn from the final regression equation. At each inclusion level, F values indicate that R^2 is significantly different from zero, allowing the inference that the variation trends do exist in the parent population. It should be noted that when QUALCON itself is regressed on WLAT, it explains 16.6% of the variation in the dependent variable. As the remainder of the independent variables are included in the regression equation, an additional 2.3% of the dependent variable variation is accounted for. This indicates that QUALCON is by far the most prominent variable present in explaining variation in Wildlife Law attitudes among hunters.

After inclusion level 2, none of the coefficients of the remaining independent variables are significantly different from zero and the regression equation can be specified in terms of the first two variables included:

$$\begin{array}{llll} \text{WLAT} = 61.263 + & .764\ \text{QUALCON} & + & 1.433\ \text{Sa} \\ & (.092) & & (.595) \end{array}$$

$$R = .423$$

---

[1] The size of the regression sample here is 380. In large samples the t distribution approaches the normal distribution. In this sense, at a two tailed probability level of .05, the critical value of t is 1.96. Any reported t values equal or greater than 1.96 indicate that the regression coefficient is significantly different from zero.

Table 6.2

Stepwise Wildlife Law Attitude Regression Results

Step		Constant	QUALCON	Sa	AGE	E1	D1	R	R^2	F	d.f.
1	B	66.357	0.796					.408	.166	75.327*	1;378
	S.E.		(.092)								
	t		8.652*								
2	B	61.263	0.764	1.433				.423	.179	41.048*	2;377
	S.E.		(.092)	(.595)							
	t		8.304*	2.408*							
3	B	62.941	0.782	1.508	-0.070			.432	.186	28.708*	3;376
	S.E.		(.092)	(.594)	(.037)						
	t		8.500*	2.539*	-1.892						
4	B	62.031	0.770	1.518	-0.066	1.272		.435	.189	21.838*	4;375
	S.E.		(.093)	(.594)	(.037)	(1.167)					
	t		8.280*	2.556*	-1.784	1.090					
5	B	61.641	0.761	1.550	-0.059	1.247	0.697	.435	.189	17.476*	5;374
	S.E.		(.095)	(.599)	(.038)	(1.170)	(1.512)				
	t		8.011*	2.588*	-1.816	1.066	.461				

* significant at greater than the .05 level.

N = 380

$R^2 = .179$

$F\ (2;377) = 41.048$

The attitudes of a hunter's significant others toward Wildlife Law and his overall quality of contact with Wildlife Officers together account for approximately 18% of the variation in his own attitude toward Wildlife Laws.

Attitudes Toward Wildlife Officers

A similar regression analysis is also performed using attitude towards Wildlife Officers as the dependent variable. The independnet variables are quality of contact, significant others' attitudes, age, residence and violation status. As an initial step in the analysis, the simple correlations among all variables are viewed for the possible presence of multicollinearity. Table 6.3 shows the correlation matrix for all considered variables in the regression model. In that table, the only correlation of any considerable strength is between quality of contact and attitude toward Wildlife Officers. This correlation is with the dependent variable; therefore, there is no concern with respect to any evidence of multicollinearity. Regression analysis will thus proceed with all specified variables included in a stepwise fashion.

Table 6.4 shows the results of the regression concerning attitudes toward Wildlife Officers (WOAT) as the dependent variable. The independent variables enter into the model in the same order of importance as in the WLAT regression except for D1 and E1 which enter at different inclusion levels. At each level of inclusion the independent variable QUALCON has a coefficient significantly greater than zero. The coefficients of the remain-

Table 6.3

Correlation Matrix for Specified Variables in WOAT Regression

	WOAT	QUALCON	Sa	AGE	D1	E1
WOAT	1.00	.72432	.10561	.09681	.14527	.06385
QUALCON		1.00	.13722	.14124	.23529	.12934
Sa			1.00	.09417	-.05820	.01420
AGE				1.00	.16275	-.04965
D1					1.00	.08659
E1						1.00

ing variables have corresponding t values less than 1.96 and the null hypothesis for these cases that B=0 cannot be rejected. Each step of the regression analysis indicates that R^2 is significantly different from zero at the corresponding degrees of freedom.

The regression results given in Table 6.4 show that Quality of Contact is again the major independent variable considered of influence on WOAT. At the first inclusion level, QUALCON also accounted for 52.5% of the variation in WOAT. After all other independent variables were included, the increase in R^2 was only 0.5%. None of the remaining variables included from the second level onward were significantly different from zero, indicating that the final model can be expressed with two variables.

$$\text{WOAT} = 44.633 + \underset{(.079)}{1.620}\ \text{QUALCON}$$

$$R = .724$$

$$R^2 = .525$$

$$F\ (1;376) = 414.978$$

Quality of overall contact with Wildlife Officers accounts for 52.5 % of

Table 6.4

Stepwise Wildli[illegible] Officer Attitude Regression Results

Step		Constant	QUALCON	Sa	AGE	D1	E1	R	R^2	F	d.f.
1	B	44.633	1.620					.724	.525	414.978*	1;376
	S.E.		(.079)								
	t		20.506*								
2	B	45.103	1.629	-0.853				.725	.526	207.690*	2;375
	S.E.		(.080)	(1.008)							
	t		20.363*	-.846							
3	B	45.504	1.642	-0.813	-0.857			.725	.526	138.414*	3;374
	S.E.		(.082)	(1.011)	(1.262)						
	t		20.024*	-.804	-.679						
4	B	45.604	1.643	-0.822	-0.835	-0.004		.725	.526	103.541*	4;373
	S.E.		(.083)	(1.015)	(1.276)	(.033)					
	t		19.795*	-0.810	-0.654	-.121					
5	B	45.383	1.641	-0.823	-0.819	-0.004	0.063	.725	.526	82.617*	5;372
	S.E.		(.084)	(1.017)	(1.285)	(.034)	(.519)				
	t		19.536*	-.809	-.637	-.118	.121				

* significant at greater than the .05 level.

N = 378

the variation in hunter attitudes toward Wildlife Officers.

The results of both regressions display similar trends. In each case, the hunters' overall experiences with Wildlife Officers are the major factor in explaining attitude favorability toward both Wildlife Laws and Wildlife Officers. On the other hand, measures of indirect influence on attitude favorability included in this regression model (age, residence and significant others' attitudes) generally had little impact in explaining hunter attitude variation. Only in the Wildlife Law attitude regression was significant others' attitude a significant explanatory variable. The remaining indirect influence variables showed no significant explanatory power with respect to both attitude variables.

In a practical sense, the hunters' overall quality of experiences with Wildlife Officers is the greatest determining factor of hunter attitudes toward Wildlife Laws and Officers. The manner in which Wildlife Officers handle encounters with hunters in the field has direct bearing upon the attitudes of hunters.

CHAPTER VII

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

General Findings

The major purpose of this thesis was to assess the attitudes of hunters toward Alberta's Wildlife Laws and Wildlife Officers within a theoretical framework of attitude formation which had direct application to empirical measurement. In this sense, hypothesized attitudinal differences were analyzed for hunters who were known violators and non-violators, and for hunters of varying socio-economic and demographic backgrounds. In addition to this, various social psychological variables were investigated to determine their relationships with attitude favorability among hunters.

General findings of this research indicated that attitudes toward Wildlife Laws and Officers of sampled hunters as a whole were favorable. Total attitude score distributions pertaining to each attitude object tended to be concentrated toward the favorable extreme. In both cases however, violator attitudes were shown to be significantly less favorable than those of the non-violators. This result supported the hypothesis that the violation situation may have been a significant factor in determining attitude favorability among hunters.

It was also found for the hunter sample as a whole that the favorability of attitudes toward both Wildlife Laws and Officers were positively related to the overall quality of contacts which hunters had with Wildlife Officers. The more positively a hunter rated his experiences with Wildlife Officers, the more favorable was his attitudinal outlook. It was also found that violators reported significantly less favorable overall experiences with Wildlife Officers than non-violators.

Although the area of direct influence on attitude favorability proved to be confirmed in analysis, this was generally not the case in terms of indirect influence. Hypothesized relationships concerning values with the various background variables and attitudes of hunters failed to be upheld. It was found that hunters of varying socio-economic and demographic backgrounds did not have differing value structures, nor did differences in attitude favorability prove to be related to differences in values among hunters. In addition to this, background variables did not prove to be related to differences in attitude favorability among hunters with the exception of age and residence. Hunters of rural background tended to have less favorable attitudes towards Wildlife Laws than urban hunters. Hunters under the age of thirty or of rural backgrounds also had less favorable attitudes toward Wildlife Officers than other hunters.

Another area of indirect influence on attitude favorability studied in this thesis was the attitudes of a hunter's significant others . It was hypothesized that a hunter's ratings of the favorability of his significant others' attitudes toward Wildlife Laws and Officers would be positively related to his own. Correlations regarding this hypothesis were significant. Correlations indicated that perceived significant others' attitudes were more strongly related to the hunters' attitudes toward Wildlife Officers than they were in terms of Wildlife Laws. The relationships between significant others' and hunter attitudes may also be exemplified by the finding that known violators are significantly more likely than non-violators to know other hunters who have violated Alberta's Wildlife Laws.

As a final aspect of analysis, all those variables found to be significantly related to attitude favorability among hunters were included in a multiple regression analysis. The violation situation, overall quality of contact, age, residence and significant others' attitudes were simultaneously tested for their impact in determining attitude favorability toward Wildlife Laws and Officers. In the case of Wildlife Law attitudes,only two variables, quality of contact and significant others' attitudes played a significant role in determining attitude favorability. These variables combined explained 18% of the variation in Wildlife Law attitudes, in which case quality of contact accounted for nearly all the explained variation. In the case of the Wildlife Officer attitude regression, only quality of contact was instrumental in explaining attitude favorability. Quality of contact alone accounted for over 50% of the variation in attitudes toward Wildlife Officers. Regression results are somewhat contrary to those obtained in bivariate analyses, and this is likely a result of spurious correlations existing among some of the study variables. For instance, the violation situation was not prominent in regression analysis but was significantly related to differences in hunter attitudes at the bivariate level. This contradiction may have been a result of the relationships found between violation status and overall quality of Officer contact of hunters.

The general results of this thesis imply that attitudes toward Wildlife Laws and Officers among hunters are to a large extent determined by direct experience with Wildlife Officers. The violation situation proved to be a source of attitudinal differences among hunters. Those hunters who had been apprehended by a Wildlife Officer showed a greater tendency to develop less favorable attitudes toward both Wildlife Laws and Officers.

It seems reasonable that this type of situation could instill sensitive feelings in the mind of a hunter. The Wildlife Officer's dilemma of maintaining proper enforcement standards within an informal recreational atmosphere is well exemplified by this finding.

The finding that hunter attitudes are related to their overall quality of experiences with Wildlife Officers suggests that the manner in which Wildlife Officers handle encounters with hunters in the field has considerable bearing upon hunter attitudes. Public perceptions of Alberta's Wildlife Resource Agency seem to be dependent upon the soundness of the related legislation itself, and the success of the Wildlife Officer in conveying a credible image of the Agency to the public. Since the Wildlife Officer is the major liason between Wildlife Resource Administrators and the hunting public and the person who is instrumental in the enforcement of Wildlife Legislation, the burden to a large extent rests upon his shoulders. Results of this study indicate that Wildlife Officers have been generally successful in maintaining a positive public image by operating in their current fashion.

Recommendations

In light of the findings in this study, various policy and research recommendations are suggested. In an effort to reduce the differences in attitude favorability among hunters who are known violators and those who are non-violators, and to further enhance the Agency's public image, the following things could be considered.

1. Evaluate current in-service training programs for Wildlife Officers. This would involve a review and assessment of pre-recruitment educational opportunities available to potential Wildlife Officers. Training in social-

psychological areas such as interactive skills and tactical encounter methods should be included in the Wildlife Officer's education. The extent to which this type of training is available to the Officers before and after recruitment should be investigated. Greater emphasis upon these skills might assist the Wildlife Officers in handling the violation situation in such a way as to narrow the gap between violator/non-violator attitudes.[1]

2. Review recent violation records to determine what types of laws are most commonly broken and reasons for such. More intensive research on violators could reveal causes for inadvertent violation, repetitive violations and other related problems. Programs could be initiated to better educate hunters in the most problematic regulatory areas.

The Wildlife Agency must endeavor to find out more about the nature of the people whose recreation they are controlling. Comparative studies of violators and non-violators are only a first step in this area. Further research could more specifically investigate the following areas:

1. Hunter Motivation and Hunter Preferences: Previous research has shown that hunters do not pursue the sport merely for economic reasons and that there are various psychological factors which are significant in determining hunter behavior.[2] Knowledge of these factors could serve as a basis for helping Officers interact with hunters in the field.

---

[1] Robert H. Giles, Jr., "Wildlife Law Enforcement and Research Needs," in Readings in Wildlife Conservation, eds., James A. Bailey, et al. (Washington, D.C.: The Wildlife Society, 1974), pp. 558-561.

[2] Thomas A. More, "Attitudes of Massachusetts Hunters," pp. 230-234.

2. Hunter Knowledge and Opinion about Laws: Research in this area could further help to reveal reasons for hunting violations. Lack of knowledge of Wildlife Laws may be directly related to less favorable attitudinal outlooks among hunters. If this were the case, greater information exposure regarding regulatory changes or complicated areas could then serve to help eliminate this problem.

Results of this study have indicated that known violators and non-violators have considerable background differences. This type of information could be used in an attempt to decrease violation rates. Part of any existing problems in this area might be resolved through greater extension on behalf of the Resource Agency. Possible areas of programming need are:

1. Establish direct Wildlife Officer rapport with the younger hunters in schools. Extra-curricular clubs or informal seminars could help familiarize the young adults with the nature of the Wildlife Officer's job and to help them realize the importance of effective Wildlife Law enforcement. This should be particularly followed in rural areas since rural hunters show less favorable attitudes.

2. Evaluate current government Hunter Education Programs. The fact that sampled violators have proportionately more formal training than non-violators suggests that this type of program may not be achieving some of its objectives. It is possible that existing training programs do not place great enough emphasis upon the legislative and regulatory aspects of hunting.

Any subsequent major alterations in Wildlife Law Enforcement should be accompanied by research similar to this at a later date. Changes in Officer training, enforcement practices and other types of related programming could influence a change in the attitude of hunters. By employing a study similar to this with compatible measurement techniques several years hence, it would be possible to assess the changes in hunter attitudes. This would serve to simultaneously monitor public image and evaluate changes in the Agency's policy direction.

BIBLIOGRAPHY

ALLPORT, Gordon W. "Attitudes." In *A Handbook of Social Psychology*, Vol. II. Edited by Carl Murchison. New York: Russell and Russell, 1935.

BLALOCK, Hubert M. *Theory Construction*. Englewood Cliffs, New Jersey: Prentice-Hall Inc., 1969.

BLALOCK, Hubert M., Jr. *Social Statistics*. Second Edition. New York: McGraw-Hill Book Co., 1972.

BOYLE, Richard P. "Path Analysis and Ordinal Data." *American Journal of Sociology*, Volume 75, Number 4, Part 1 (January 1970), pp. 461-480.

CANADIAN WILDLIFE SERVICE. *Wildlife in Man's World*. Ottawa: Queens Printer, 1964.

CARTE, Gene E. "Changes in Public Attitudes Toward the Police: A Comparison of 1938 and 1971 Surveys." *Journal of Police Science and Administration*, Volume 1, Number 2 (June 1973), pp. 224-231.

COLLINS, Barry E. "Behavior Theory." In *Theories of Cognitive Consistency: A Sourcebook*. Edited by Robert P. Abelson, Elliot Aronson, William J. McGuire, Theodore M. Newcomb, Milton J. Rosenberg and Percy H. Tannenbaum. Chicago: Rand McNally & Co., 1968, pp. 240-245.

DOOB, Leonard W. "The Behavior of Attitudes." In *Readings in Attitude Theory and Measurement*. Edited by Martin Fishbein. New York: John Wiley and Sons Inc., 1967, pp. 42-50.

DUTTA, M. *Econometric Methods*. Cincinnati: South-Western Publishing Co., 1975.

FERGUSON, George. *Statistical Analysis in Psychology and Education*. Second Edition. New York: McGraw-Hill Book Co., 1966.

FISHBEIN, Martin. "Attitude and the Prediction of Behavior." In *Readings in Attitude Theory and Measurement*. Edited by Martin Fishbein. New York: John Wiley and Sons Inc., 1967, pp. 477-492.

________. "A Behavior Theory Approach to the Relations Between Beliefs About An Object and the Attitude Toward the Object." In *Readings in Attitude Theory and Measurement*. Edited by Martin Fishbein. New York: John Wiley and Sons Inc., 1967, pp. 389-400.

________. "A Consideration of Beliefs, and Their Role in Attitude Measurement." In *Readings in Attitude Theory and Measurement*. Edited by Martin Fishbein. New York: John Wiley and Sons Inc., 1967, pp. 257-266.

FISHBEIN, Martin and Ajzen, Icek. *Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research*. Reading, Massachusetts: Addison-Wesley Publishing Co., 1975.

GARRETT, J.R. Characteristics of Nevada Hunters. B. 22. Reno, Nevada: University of Nevada, June 1970.

GILES, Robert H., Jr. "Wildlife Law Enforcement and Research Needs." In Readings in Wildlife Conservation. Edited by James A. Bailey, William Elder and Ted McKinney. Washington, D.C.: The Wildlife Society, 1974, pp. 557-561.

GREEN, Bert F. "Attitude Measurement." In Handbook of Social Psychology: Vol. I. Edited by Gardner Lindzey. Cambridge, Mass.: Addison-Wesley Publishing Co. Inc., 1954, pp. 335-369.

GREENWALD, Anthony G. "On Defining Attitude and Attitude Theory." In Psychological Foundations of Attitude. Edited by Anthony G. Greenwald, Timothy C. Brock and Thomas M. Ostrom. New York: Academic Press, 1968, pp. 361-388.

HENDEE, John D. and Potter, Dale R. "Human Behavior and Wildlife Management." 36th North American Wildlife and Natural Resources Conference Transactions. Washington, D.C.: Wildlife Management Institute, 1971, pp. 383-392.

HOGARTH, John. Sentencing as a Human Process. Toronto: University of Toronto Press, 1971.

HOLLANDER, Edwin P. Principles and Methods of Social Psychology. Second Edition. New York: Oxford University Press, 1971.

INSKO, Chester A. Theories of Attitude Change. New York: Appleton-Century-Crofts Publishing Co., 1967.

INSKO, C.A. and Schopler, C. "Triadic Consistency: A Statement of Affective-Cognitive-Conative Consistency." Psychological Review, Vol. 74 (1967), pp. 361-376.

KERLINGER, Fred N. Foundations of Behavioral Research. Second Edition. New York: Holt Rinehart and Winston Inc., 1973.

KESEL, James A. "Some of the Characteristics and Attitudes of Michigan Deer Hunting Violators." M. Sc. Thesis, Michigan State University, 1974.

KIESLER, Charles A., Collins, Barry E. and Miller, Norman. Attitude Change: A Critical Analysis of Theoretical Approaches. New York: John Wiley and Sons Inc., 1969.

LEVIN, J. Elementary Statistics in Social Research. New York: Harper and Row Publishers, 1973.

LIKERT, R. "A Technique for the Measurement of Attitudes." Archives of Psychology, Vol. 22 (1932), pp. 1-55.

LOTT, Albert J. and Lott, Bernice J. "A Learning Theory Approach to Interpersonal Attitudes." In *Psychological Foundations of Attitudes*. Edited by A.G. Greenwald, T.C. Brock and T.M. Ostrom. New York: Academic Press, 1968, pp. 67-88.

LOTT, Bernice E. "Attitude Formation: The Development of a Color Preference Response Through Mediated Generalization." In *Readings in Attitude Theory and Measurement*. Edited by Martin Fishbein. New York: John Wiley and Sons Inc., 1967, pp. 366-372.

McGUIRE, William J. "The Nature of Attitudes and Attitude Change." In *The Handbook of Social Psychology: Volume III*. Edited by Gardner Lindzey and Elliot Aronson. Second Edition. Reading, Massachusetts: Addison-Wesley Publishing Co., 1969, pp. 130-314.

MORE, Thomas A. "Attitudes of Massachusetts Hunters." *36th North American Wildlife and Natural Resources Conference Transactions*. Washington, D.C.: Wildlife Management Institute, 1971, pp. 230-234.

MORSE, William B. "Law Enforcement: A Tool of Management." In *Readings in Wildlife Conservation*. Edited by J.A. Bailey, W. Elder, and T.D. McKinney. Washington, D.C.: The Wildlife Society, 1974, pp. 551-555.

MYLONAS, A.D. and Reckless, W.C. "Attitudes Toward Law Enforcement in Greece and the United States." *Journal of Research in Crime and Delinquency,* Volume 5, Number 1 (1968), pp. 81-88.

NIE, Norman H., *et al*., Editors. *Statistical Package for the Social Sciences*. Second Edition. New York: McGraw-Hill Book Co., 1975.

PEPITONE, Albert. "Some Conceptual and Empirical Problems of Consistency Models." In *Cognitive Consistency: Motivational Antecedents and Behavioral Consequents*. Edited by Shel Feldman. New York: Academic Press Inc., 1966, pp. 257-297.

PODGORECKI, Adam, *et al*. *Knowledge and Opinion About Law*. Law in Society Series. Edited by C.M. Campbell, W.G. Carson and P.N.P. Wiles. London: Martin Robertson and Company Ltd., 1973.

PORTUNE, Robert. *Changing Adolescent Attitudes Toward Police*. Cincinnati: The W.H. Anderson Company, 1971.

RHINE, Ramon J. "A Concept-Formation Approach to Attitude Acquisition." In *Readings in Attitude Theory and Measurement*. Edited by Martin Fishbein. New York: John Wiley and Sons Inc., 1967, pp. 382-388.

ROKEACH, Milton. *Beliefs, Attitudes and Values: A Theory of Organization and Change*. San Fransisco: Jossey-Bass Inc., 1968.

ROSENBERG, Milton J. "An Analysis of Affective-Cognitive Consistency." In *Attitude Organization and Change: An Analysis of Consistency Among Components*. Edited by M.J. Rosenberg, C.I. Hovland, W.J. McGuire, R.P. Abelson and J.W. Brehm. New Haven: Yale University Press, 1960, Chapter II, pp. 15-64.

________. "Cognitive Structure and Attitudinal Affect." In Readings in Attitude Theory and Measurement. Edited by Martin Fishbein. New York: John Wiley and Sons Inc., 1967, pp. 325-331.

SCHOLE, Bernard J. A Literature Review on Characteristics of Hunters. Special Report Number 33. Colorado: Division of Wildlife, November 1973.

SCOTT, William A. "Attitude Measurement." In The Handbook of Social Pschology: Vol. 2. Second Edition. Edited by Gardner Lindzey and Elliot Aronson. Reading, Massachusetts: Addison-Wesley Publishing Co., 1968, pp. 204-273.

SECORD, Paul F. and Backman, C.W. Social Psychology. New York: McGraw-Hill, 1964.

SEILER, Laureen H. and Hough, Richard L. "Empirical Comparison of the Thurstone and Likert Techniques." In Attitude Measurement. Edited by Gene Summers. Chicago: Rand McNally and Co., 1969, pp. 159-173.

SELLITZ, C.; Jahoda, M.; Deutsch, M.; and Cook, S.W. Research Methods in Social Relations. New York: Holt, Rinehart and Winston, 1959.

SHAFER, E.L.; Amidon, P.H. and Severinghaus, C.W. "A Comparison of Violators and Non-Violators of New York Deer Hunting Laws." Journal of Wildlife Management, Vol. 36 (1972), pp. 933-939.

SHAW, Marvin E. and Wright, Jack M. Scales for the Measurement of Attitudes. New York: McGraw-Hill Book Co., 1967.

SHERIF, M. and Sherif, C.W. Reference Groups: Exploration into the Conformity and Deviance of Adolescents. New York: Harper and Row, 1964.

SHIBUTANI, T. "Reference Groups as Perspectives." American Journal of Sociology, Vol. 60 (1955), pp. 562-570.

SIEGEL, Sidney. Non-Parametric Statistics for the Behavioral Sciences. New York: McGraw-Hill Book Co., 1956.

SINGER, Jerome E. "Motivation for Consistency." In Cognitive Consistency: Motivational Antecedents and Behavioral Consequents. Edited by Shel Feldman. New York: Academic Press Inc., 1966, pp. 47-73.

STAATS, Arthur W. "An Outline of an Integrated Learning Theory of Attitude Formation and Change." In Readings in Attitude Theory and Measurement. Edited by Martin Fishbein. New York: John Wiley & Sons Inc., 1967, pp. 373-376.

________, and Staats, Carolyn K. "Attitude Established by Classical Conditioning." Journal of Abnormal and Social Psychology, Vol. 57 (1958), pp. 37-40.

STOLL, Gregg D. "The Attitudes of Recreational Resource Users Arrested by Michigan Conservation Officers." M. Sc. Thesis, Michigan State University, 1975.

THOMAS, Kerry, Editor. Attitudes and Behavior: Selected Readings. Middlesex, England: Penguin Books Ltd., 1971.

THURSTONE, Louis L. and Chave, E.J. The Measurement of Attitudes: A Psychological Method and Some Experiments With a Scale for Measuring Attitude Toward Church. Chicago: University of Chicago Press, 1929.

TRIANDIS, Harry C. Attitude and Attitude Change. New York: John Wiley and Sons Inc., 1971.

WARREN, Neil and Jahoda, Marie, Editors. Attitudes: Selected Readings. Second Edition. Middlesex, England: Penguin Books Ltd., 1973.

APPENDIX A

THE QUESTIONNAIRE AND COVERING LETTERS

Alberta

RECREATION, PARKS
AND WILDLIFE

FISH AND WILDLIFE DIVISION,
10363 - 103 Street,
Edmonton, Alberta.
T5J 1L8.

August 25, 1976

Dear Sportsman:

Your cooperation in participating in an evaluation of Alberta's Wildlife Laws and the Officers that enforce them is respectfully solicited.

Your name was randomly selected from a list of people hunting in the Province of Alberta. The answers you give will be held in the strictest confidence. The questionnaire enclosed is an opinion survey aimed at helping us to understand any existing problems, and to better serve resource users like yourself.

It is of extreme importance that we know how well we are performing our task, and you can play an important role by completing the attached questionnaire. Your comments or suggestions in the space provided are also encouraged.

We would request that you return the questionnaire on or before Sept. 15. For your convenience, we have enclosed a stamped, self-addressed envelope.

Your cooperation is most appreciated.

Mike Melnyk,
Researcher.

E. J. Psikla,
Branch Head,
Field Services - Enforcement,
Fish and Wildlife Division.

ENCLS.

Alberta

RECREATION, PARKS
AND WILDLIFE

FISH AND WILDLIFE DIVISION,
10363 - 108 Street,
EDMONTON, Alberta.
T5J 1L8.

October 5, 1976

Dear Sportsman:

Your co-operation in participating in an evaluation of Alberta's Wildlife Laws and the Officers that enforce them is respectfully solicited.

About one month ago your name was randomly selected from a list of people hunting in the Province of Alberta and you were sent the attached questionnaire. Our records show that we presently do not have a response from you and it is likely the original questionnaire could have gone astray.

The questionnaire is an opinion survey designed to help us understand any existing problems and to better serve resource users like yourself. You can be of valuable assistance by completing the enclosed copy. Please be assured the answers will be held in the strictest confidence.

We would appreciate it if you could return the attached on or before October 30, 1976. For your convenience, a stamped, self-addressed envelope is enclosed.

Your co-operation in participating in this research program is deeply appreciated.

Mike Melnyk,
Researcher.

E. J. Psikla,
Branch Head,
Field Services - Enforcement,
Fish and Wildlife Division.

ENCL.

HUNTER ATTITUDES

The objective of this study is to measure hunter perceptions of the Alberta Government's Wildlife Law enforcement effort. Basically, we need to determine how you, the hunter feels about the existing laws embodied within Alberta's Wildlife Act, and about the Wildlife Officers who enforce these laws. The questions which follow are geared toward recognizing any problems which may exist in these areas. You may rest fully assured that the information gained from these questions will be treated with the strictest confidentiality.

This first section deals with your personal background. Please be as accurate as possible.

1. What was your age at your last birthday? ______________ years

2. What is your sex? male ☐ female ☐

3. At present are you:

single ☐
married ☐
separated ☐
divorced ☐
widowed ☐

4. Where do you presently live?

Rural Farm (population under 1000 where your main income is derived from farming) ☐

Rural Non-farm (population under 1000 where your main occupation is other than farming) ☐

Urban (if you live in a place where the population is over 1000) ☐

5. What is the highest grade or year of elementary or secondary school you have ever attended?

☐ No schooling

☐ Kindergarten

Elementary and Secondary

1	2	3	4	5	6	7	8	9	10	11	12	13
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

6. How many years of school have you had since secondary school? Please check the appropriate boxes.

University	None ☐	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6+ ☐
Other (includes business schools, technological institutes, community colleges, teacher's colleges, schools of nursing, etc.)	None ☐	1 ☐	2 ☐	3 ☐	4+ ☐		

7. Please estimate your total household income for 1975. If you are single and live alone estimate your own income. If you live with your family or relatives, state the total combined income for all money earners in the household.

☐ $0 - $4999
☐ $5000 - $9999
☐ $10,000 - $14,999
☐ $15,000 - $19,999
☐ $20,000 - $24,999
☐ $25,000 - $29,999
☐ $30,000 - and over

8. If you are presently in the labor force, what is your type of occupation? If you are in the labor force, but are presently unemployed for any reason, then please state your last type of occupation.

☐ Managerial, Administrative and related
☐ Teaching and related
☐ Medicine and Health
☐ Technological, Social, Religious, Artistic and Related
☐ Clerical and related
☐ Sales
☐ Service
☐ Farming, Horticulture and Animal Husbandry
☐ Other Primary Occupations
☐ Processing
☐ Machinery, Product Fabricating, Assembly and Repair
☐ Construction Trades Occupations
☐ Transport Equipment Operating Occupations
☐ Other - Please Specify ______________________________
☐ If you answered question 8, proceed directly to question 10.

9. If you are presently not in the labor force, are you:

☐ housewife
☐ student
☐ retired
☐ other - please specify ______________________________

10. As accurately as possible please state the number of seasons that you have hunted: __________ seasons

The next part of the questionnaire deals with your own attitudes and feelings. This is the most important part of the questionnaire so please attempt to answer all questions as accurately as possible.

11. Everybody guides their daily life by certain values which they hold important. Because no two people are quite the same, some values will be more important to some people than to others. Below is a list of 18 general values. For each of the 18 values place a check mark in one of the boxes that indicates how important the value is to you.

		least importance	little importance	moderate importance	much importance	great importance
1.	AMBITIOUS hard-working, aspiring					
2.	BROADMINDED open-minded					
3.	CAPABLE competent, effective					
4.	CHEERFUL lighthearted, joyful					
5.	CLEAN neat, tidy					
6.	COURAGEOUS standing up for your beliefs					
7.	FORGIVING willing to pardon others					
8.	HELPFUL working for the welfare of others					
9.	HONEST sincere, truthful					
10.	IMAGINATIVE daring, creative					
11.	INDEPENDENT self-reliant, self-sufficient					
12.	INTELLECTUAL intelligent, reflective					
13.	LOGICAL consistent, rational					
14.	LOVING affectionate, tender					
15.	OBEDIENT dutiful, respectable					
16.	POLITE courteous, well mannered					
17.	RESPONSIBLE dependable, reliable					
18.	SELF-CONTROLLED restrained, self-disciplined					

12. Below is a list of statements concerning Alberta's Wildlife Laws. Wildlife Laws are those laws developed by the Alberta Government under the Wildlife Act and its regulations. Please indicate your attitudes toward these laws by checking off in the squares provided whether you strongly disagree, disagree, are undecided, agree or strongly agree with each statement. The series of squares at the right of each statement are provided for your checkmarks. Place your mark in the square which best shows how you really feel about each statement.

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
Generally, Wildlife Law penalties are not a great enough deterrant for violating hunters.	☐	☐	☐	☐	☐
Stricter penalties are needed to control many of the unnecessary hunting violations.	☐	☐	☐	☐	☐
Hunters should obey Wildlife Law even though they may criticize it.	☐	☐	☐	☐	☐
Wildlife Law represents the wishes of a small minority of people.	☐	☐	☐	☐	☐
It is impossible to keep up with the constant changes of Wildlife Law.	☐	☐	☐	☐	☐
Wildlife Laws prevent the overconsumption of a valuable resource.	☐	☐	☐	☐	☐
Wildlife Law originates in the common needs and desires of the people.	☐	☐	☐	☐	☐
Wildlife Laws are basically well thought out.	☐	☐	☐	☐	☐
Wildlife Law unnecessarily restricts the freedom of hunters.	☐	☐	☐	☐	☐
The courts do not consider Wildlife Law seriously enough.	☐	☐	☐	☐	☐
Wildlife Laws are not applicable to hunters' recreational needs.	☐	☐	☐	☐	☐
A hunter should only respect those Wildlife Laws which seem reasonable.	☐	☐	☐	☐	☐
Many detailed regulations within Wildlife Law do not demand the hunter's respect.	☐	☐	☐	☐	☐
Personal circumstances are never an excuse for violating Wildlife Law.	☐	☐	☐	☐	☐
Wildlife Laws are generally much more reasonable than other types of laws.	☐	☐	☐	☐	☐
Wildlife Law only serves to unnecessarily restrict the freedom of hunters.	☐	☐	☐	☐	☐
We have too many Wildlife Laws.	☐	☐	☐	☐	☐
Wildlife Laws are not applied in a standard manner.	☐	☐	☐	☐	☐
Wildlife Laws are clearly spelled out in the available pamphlets.	☐	☐	☐	☐	☐
Wildlife Law penalties are too strict.	☐	☐	☐	☐	☐
Many Wildlife Laws cannot be easily interpreted by the hunter.	☐	☐	☐	☐	☐
The hunter who refuses to obey Wildlife Law is a bother to other hunters.	☐	☐	☐	☐	☐
Wildlife Law protects hunters from the misdeeds of other hunters.	☐	☐	☐	☐	☐
Wildlife Law is unnecessarily complex.	☐	☐	☐	☐	☐

13. Below is a list of statements concerning Alberta's Fish and Wildlife Officers. Whether you have actually come across a Wildlife Officer in the past or not, indicate your attitudes toward them by checking off how you feel about each statement. The squares at the right of each statement are provided for you to check whether you strongly disagree, disagree, are undecided, agree or strongly agree with each statement.

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
Wildlife Officers are very professional in carrying out their duties.	☐	☐	☐	☐	☐
Wildlife Officers are knowledgeable of modern scientific training methods.	☐	☐	☐	☐	☐
Wildlife Officers tend to be abusive of their authority.	☐	☐	☐	☐	☐
Wildlife Officers are a greater help to hunters than pamphlets and written information.	☐	☐	☐	☐	☐
Wildlife Officers tend to think of themselves as superior to hunters.	☐	☐	☐	☐	☐
Most Wildlife Officers are honest.	☐	☐	☐	☐	☐
There are only a few Wildlife Officers responsible for any bad publicity which they may get.	☐	☐	☐	☐	☐
Wildlife Officers are more concerned with their appearance rather than performance of duty.	☐	☐	☐	☐	☐
Wildlife Officers are generally of less than ordinary ambition.	☐	☐	☐	☐	☐
Wildlife Officers are not tactful when talking to hunters.	☐	☐	☐	☐	☐
Wildlife Officers sometimes try to charge innocent hunters with a violation.	☐	☐	☐	☐	☐
Wildlife Officers deserve more respect than they get from hunters.	☐	☐	☐	☐	☐
Wildlife Officers like to ask leading questions to hunters in order to apprehend them.	☐	☐	☐	☐	☐
Wildlife Officers are more pleasant than hunters think they are.	☐	☐	☐	☐	☐
Generally, Wildlife Officers are in too poor physical condition to carry out their duties.	☐	☐	☐	☐	☐
Many Wildlife Officers just seem to enjoy giving hunters a hard time.	☐	☐	☐	☐	☐
Wildlife Officers are selected on the basis of their personal merit and ability.	☐	☐	☐	☐	☐
Wildlife Officers are usually able to make quick and intelligent decisions.	☐	☐	☐	☐	☐
Wildlife Officers are quite conscientious in carrying out their duties.	☐	☐	☐	☐	☐
Wildlife Officers seem to be quite dependable.	☐	☐	☐	☐	☐
On the whole, Wildlife Officers appear to be poorly trained.	☐	☐	☐	☐	☐
Wildlife Officers often carry a grudge against hunters.	☐	☐	☐	☐	☐
It would be desirable to have fewer Wildlife Officers.	☐	☐	☐	☐	☐
It gives me a secure feeling to encounter a Wildlife Officer in the field while I'm hunting.	☐	☐	☐	☐	☐

14. If you were out hunting and observed another hunter committing what you thought was a serious Wildlife Law offense, what would you MOST LIKELY do? Please check one item only.

I would report it to either the Wildlife Officer in the area, the nearest district Wildlife Office or R.C.M.P. detachment. ☐

I would tell the other hunter he was doing something wrong and contact the nearest Wildlife Office after my hunting trip. ☐

I would tell the other hunter he was doing something wrong, and if he didn't correct it, I would report it to the officials later on. ☐

I wouldn't say anything to the other hunter, and would report it only if I happened to come across a Wildlife Officer later that day. ☐

I would mention it to the other hunter, but make no attempt to report it to the officials. ☐

I would forget about the situation altogether. ☐

15. If you were to see a Wildlife Officer in the field while you were hunting, what would your usual reaction be? Please check the one item which best indicates which you would MOST LIKELY do?

I would go out of my way to approach him regardless of what I was doing. ☐

I would approach him if he seemed to want to speak to me. ☐

I would approach him if I thought that I wasn't doing anything wrong. ☐

I would neither approach nor avoid the Wildlife Officer. ☐

I would approach him only if it seemed suspicious to walk away. ☐

I would make an attempt to actively avoid him. ☐

16. From which of the following did you receive most of your hunter training? Please check one item only.

Formal training in a school or club ☐
Training from father ☐
Training from other experienced hunters ☐
Learned on my own ☐
Other - Please specify ______________________

17. Have you been in the past or are you presently a member of some type of fish and game association? yes ☐ no ☐

18. During the hunting seasons for the years listed below, how many times would you say you encountered a Wildlife Officer while you were hunting?

1973	1974	1975
Number of times ___	Number of times ___	Number of times ___
Did not hunt ☐	Did not hunt ☐	Did not hunt ☐

I have never encountered a Wildlife Officer throughout all the years that I have hunted. ☐

If you have NEVER come across a Wildlife Officer while you were hunting, skip the next two questions and go directly to question 21.

19. Although different things may have happened each time you met a Wildlife Officer, while you were hunting, what usually happened? Check as many as apply.

The Wildlife Officer stopped and talked to me but did not check me ☐
The Wildlife Officer checked me ☐
The Wildlife Officer charged me with a violation ☐

20. On the basis of your contacts with Wildlife Officers throughout your years of hunting, how did they behave toward you? Please rate the overall performance of Wildlife Officers that you have encountered in terms of each of the following characteristics:

	Not	Somewhat	Moderately	Very	Extremely
Fair	☐	☐	☐	☐	☐
Suspicious	☐	☐	☐	☐	☐
Respectful	☐	☐	☐	☐	☐
Polite	☐	☐	☐	☐	☐
Authoritarian	☐	☐	☐	☐	☐
Efficient	☐	☐	☐	☐	☐
Arrogant	☐	☐	☐	☐	☐

21. When you go hunting, who do you generally go with? Check one which best applies.

Close relatives and family ☐
Close friends ☐
Work associates ☐
Guide ☐
Usually hunt alone ☐
Other (please specify) ____________________

22. How would you rate the general attitudes of your close friends and relatives that hunt toward Wildlife Law?

Very Favourable	Favourable	Indifferent	Unfavourable	Very Unfavourable
☐	☐	☐	☐	☐

23. How would you rate the general attitudes of your close friends and relatives that hunt, toward Wildlife Officers?

Very Favourable	Favourable	Indifferent	Unfavourable	Very Unfavourable
☐	☐	☐	☐	☐

24. Have any of your close friends, relatives or work associates been charged with a Wildlife Law violation in 1975?

Yes	No	Don't Know
☐	☐	☐

Thank you for completing this questionnaire. If you would like to make any comments about this topic feel free to write them in the space provided below.

APPENDIX B

COMPARISON OF THE STUDY SAMPLE TO THE REGION 7 HUNTER POPULATION

In Chapter III, the possibility of a non-response bias affecting the obtained survey results was addressed. Although there were no statistical differences found among first and second mailing respondents, nearly half of the original sample did not respond. To investigate the possibility of a consistent bias existing through both questionnaire mailings, the hunter sample was statistically compared to its parent population to determine whether differences existed between the two groups.

Computerized residence license data were examined to obtain the Region 7 population distribution for age and sex which were the only demographic variables recorded on hunter licenses. The total count for 1975 Region 7 licensees was 51,978. The data reported in this Appendix will differ slightly from this total since some hunters did not completely fill out their license forms.

Age distributions for the hunter sample and its population are provided in Table B-1 on the following page. The sample contains 40% of its hunters in the 29 or under age groups while the population contains approximately 43% in this category. Average ages for the sample and population are 34.83 and 34.9 years, respectively. The Chi Square goodness of fit test indicated that there is no significant ($\alpha = .05$) difference in the distributions for the two groups. At 10 degrees of freedom, the obtained χ^2 value of 10.79 is significant only at the .50 level.

Table B-2 shows the sex distribution of the Region 7 hunter population and the study sample. The sex breakdowns for the two groups are closely similar. Females represented approximately 3.3% in the population and 3.4% in the study sample. The calculated Chi square value is not significant at the .05 level with 1 degree of freedom. It is concluded that there are no differences in the sex distributions of the hunter population

Table B-1

Age Distribution for the Region 7 Hunter Population and the Study Sample

Age Groups (Yrs)	Population freq.	Population pct.	Sample freq.	Sample pct.
10 - 14	0	0	2	0
15 - 19	6031	11.62	62	11
20 - 24	8325	16.05	71	12
25 - 29	7982	15.38	105	17
30 - 34	6843	13.19	86	15
35 - 39	5423	10.44	57	10
40 - 44	4995	9.62	73	12
45 - 49	4005	7.72	59	10
50 - 54	2927	5.64	32	5
55 - 59	2116	4.08	21	4
60 - 64	1507	2.90	14	2
65 - 69	952	1.83	6	1
70 - 74	524	1.01	3	1
75 - 79	158	0.30	2	0
80 - 84	73	0.14	0	0
85 - 89	14	0.03	0	0
90+	7	0.01	0	0
TOTAL	51882	99.96	593	100

$\overline{X} = 34.83$ $\overline{X} = 34.9$

$\chi^2 = 10.79$

d.f. = 10*

Sig. = .50

* Due to low frequencies, age groups 10-14 and 15-19 were collapsed into one category, and age groups 65 and over were made into one category.

Table B-2

Sex Distribution for Region 7 Hunter Population and the Study Sample

Sex	Population freq.	Population pct.	Sample freq.	Sample pct.
Male	50250	96.73	572	96.6
Female	1641	3.27	20	3.4
TOTAL	51891	100.0	592	100.0

$\chi^2 = .09$

d.f. = 1

Sig. = .90

and the chosen study sample.

Results from these two comparisons do not indicate the presence of non-response bias at least with respect to age and sex. In terms of these two variables, the sample appears to be in close correspondence to the population distributions.

APPENDIX C

SCALING OF ATTITUDES AND RELATIONSHIPS TO THEORY

In the context of this thesis, an attitude has been considered a unidimensional concept concerned with a person's affective or evaluative response in terms of degrees of favorability or unfavorability. Attitude is an hypothetical variable extracted from the totality of salient beleifs an individual has about some object. Beliefs are likened to stimulus-response bonds linking the object in question to some attribute or characteristic which has an evaluative meaning for the individual. The product of the strength with which the individual holds a belief and his evaluation of it is the contributory evaluative loading of that particular belief to the overall related attitude. The summation of the evaluative loadings associated with the total set of salient beliefs an individual has with respect to an object indicates the degree of polarity of his overall attitude. Fishbein has summarized this in the following algebraic statement.[1]

$$A_o = \sum_{i=1}^{N} BiAi$$

where: A_o = attitude toward object o,
Bi = strength of belief i about o,
Ai = evaluative aspect of Bi,
N = number of beliefs about o.

This formulation implies various necessary conditions for the measurement of attitudes. Since the attitude concept is bipolar in nature, a measurement procedure which takes into account degrees of favorability or unfavorability must be used. Since attitudes are extracted from the totality of the individual's salient beliefs concerning an object, a scaling procedure which employs a large pool of items must be utilized. The scaling procedure would also have to take into account varying belief strengths in measuring attitudes.

---

[1] Martin Fishbein, "A Behavior Theory Approach to the Relations between Beliefs about an Object and Attitude Toward the Object," in Readings in Attitude Theory and Measurement, ed. Martin Fishbein (New York: John Wiley and Sons Inc., 1967), p. 394.

Selection of a Scaling Method

The selection of a method for measuring attitudes in this thesis involved considering between two currently widely used methods commonly known as the Thurstone and Likert techniques. Both these scaling procedures generally fulfill the theoretical requirements as presented here such that in selecting between them anticipated practical problems associated with each were of the greatest concern.

Thurstone's method of Equal Appearing Intervals was developed between 1929 and 1931.[1] To construct a Thurstone scale initially a large number of statements concerning the attitude object in question are formulated. These statements are then given to a large group of judges. The judges are asked to independently grade the statements on an eleven point continuum. This continuum represents a range from most unfavorable to most favorable with a neutral midpoint. The points between the ends of the continuum represent varying degrees of unfavorability and favorability. Each judge grades the degree of favorability or unfavorability expressed by each statement toward the object in question by locating it somewhere on the eleven point continuum.

Once all the statements are judged, scale values for the items are determined. The scale value of a statement is the median of the scores attributed to that statement by the judges. An interquartile range or Q value is computed for each statement which is a measure of interjudge variability. Those statements which exhibit the greatest amount of discrepancy among judges are rejected. A final scale is then constructed containing statements which spread themselves along the eleven point favorability continuum. In administering the scale, the subject is asked to check only those statements with which he agrees. His attitude score is calculated as the median of the scale values associated with each checked item.[1]

---

[1] L.L. Thurstone, "The Measurement of Attitudes," in Journal of Abnormal and Social Psychology, Vol. 26 (1931), pp. 249-269.

Likert's method of Summated Ratings is similar to the Thurstone method in that it initially employs the use of a large pool of items in the development of the final scale.[2] The original item pool is compiled in such a way as to provide roughly equal amounts of clearly positive and negative items. The original collection of statements is formed into a scale and administered to a small sample. Subjects are asked to indicate for each item their extent of disagreement or agreement by responding on a five point scale ranging from strongly disagree to strongly agree. The subjects' responses are scored in such a way that the more favorable the response to an item, the higher the score. In this sense, strong agreement with a positive statement or strong disagreement with a negative statement yeild a score of 5. Conversely, strong disagreement with a positive item and strong agreement with a negative item yield a score of 1. Responses of lesser degrees of favorability or unfavorability are scored within the range of 1 to 5.

The pretest sample's responses to the attitude statements are used to perform an item analysis. This procedure is used to obtain greater internal consistency and unidimensionality in the final scale. Considering all the subjects' responses, each item is correlated with its respective total scale score (the sum over each item in the scale). Those items showing the highest correlations are the only ones retained for use in the final scale. The revised scale is then administered to the actual study sample in the same manner.[1]

---

[1] For a detailed explanation regarding the construction and implementation of Thurstone scales, consult: A.L. Edwards, Techniques of Attitude Scale Construction (New York: Appleton-Century-Crofts Inc., 1957), pp. 83-119.

[2] R. Likert, "A Technique for the Measurement of Attitudes," in Archives of Psychology, Vol. 22 (1932), pp. 1-55.

The decision to use the Likert technique rather than the Thurstone technique in this thesis was based upon the conclusions made in a review of empirical comparisons of the two methods by Seeler and Hough.[2] In this review various points were considered. It was found that Thurstone and Likert scales measuring the same attitude were highly correlated, indicating that one method is as valid as the other.[3] It was also shown that various studies conclude that Likert scales tend to yield higher reliabilities than Thurstone scales containing the same number of statements.[4]

A practical problem associated with the Thurstone scaling technique is that it is more time consuming to construct and administer than the Likert scale. One study indicated that the classical Thurstone method required approximately twice the time needed for construction of a Likert scale.[5] The use of judges for item grading in the Thurstone procedure remains a questionable technique. It is not known how successfully judges can objectively grade statements without bias from their own attitude.

---

[1] For a detailed explanation of the construction of Likert scales, consult: Edwards, Techniques of Attitude Scale Construction, pp. 149-171.

[2] L.H. Seeler and R.L. Hough, "Empirical Comparisons of the Thurstone and Likert Techniques," in Attitude Measurement, ed. Gene Summers (Chicago: Rand McNally & Co., 1969), pp. 159-173.

[3] Ibid., pp. 162, 166-167.

[4] Ibid., pp. 163, 166, 169-170.

[5] Edwards, Techniques of Attitude Scale Construction, p. 169.

The Likert procedure allows more flexibility in response than the Thurstone method. If a subject is only able to totally agree to one or two items on a Thurstone scale, his attitudinal estimate may not be very reliable.

Relationships to Theory

Both Thurstone and Likert scaling techniques will presently be discussed in terms of the theoretical model used in this thesis. An attitude toward an object is expressed as:

$$A_o = \sum_{i=1}^{N} BiAi$$

This symbolization is employed to compare the two techniques in the table below.

Table C-1

Comparison of Thurstone and Likert Scaling Techniques

Properties	Thurstone	Likert
Neutral items retained	Yes	No
Item selection	Response-inferred and judgemental	Response-inferred
Values of "B"	0,1	-2 to +2
Values of "A"	-5 to +5	-1,+1
Values of B x A	-5 to +5	-2 to +2
Disbeliefs	No	Yes
Computational formula	$\frac{BiAi}{Bi}$	BiAi
Quantification	"interval"?	ordinal

Source: Martin Fishbein and Icek Ajzen, Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research (Reading, Mass.: Addison-Wesley Publishing Co., 1975), p. 79.

Table C-1 indicates that both scaling procedures hold constant one of the components in the determination of the attitude score. In the Thurstone scale, belief strength is fixed at either 1 or 0 since the subject is only allowed to agree or not respond with a particular statement. Evaluations however, vary from -5 to +5. In the Likert scale, the evaluative aspect of the belief statments is held constant at either -1 or +1. This implies that all statements are assumed to be of equal negative or positive polarity. Belief strength in this case varies from -2 to +2.

Belief strength for the Likert scale is shown to vary from -2 to +2 in Table B-1. This scoring procedure is not methodologically different from the 1 to 5 system used in this thesis. The scoring method presented in the table necessitates that the subject's score be multiplied by either -1 or +1, depending upon the polarity of a particular statement. The 1 to 5 scoring procedure yields the same results in terms of unit differences when scores are reversed for negative items. The ordinality of each procedure is exactly the same. The reasons for using the 1 to 5 scoring method over the -2 to +2 method were largely due to practical problems associated with the latter concerning coding and keypunching of responses.

Reliability of the Study Scales

The reliability of the scales used in this thesis to measure attitudes toward Wildlife Laws and Officers was determined by the split-half method.[1] The odd and even items in each scale were correlated using the Pearson statistic. These split half correlations for each scale are then corrected to obtain an estimate of the reliability of the whole scales by using the Spearman-Brown formula which is given as:

---

[1] George Ferguson, Statistical Analysis in Psychology and Education, (2nd ed.; New York: McGraw-Hill Book Co., 1966), pp. 377-378.

$$r_w = \frac{2r_h}{1+r_h}$$

where: r_h = split-half correlation for the scale,

r_w = estimate of the reliability for the whole scale.

Using this procedure, reliability estimates for each attitude scale were obtained. The corrected reliability coefficient for the Wildlife Law attitude scale was .77 and that for the Wildlife Officer attitude scale was .90. Interpreting these coefficients, 77% and 90% of the variation in the measurements are attributable to variation in the true score. The remaining 23% and 10% is attributable to error.

There is no standard rule concerning the minimum reliability required for a test. Hogarth reports however, that it is generally accepted that tests used for research purposes should have reliabilities of .5 or better.[1] Based on this, the scales used in this thesis are considered sufficiently reliable in gaining estimates of hunter attitudes.

---

[1] John Hogarth, Sentencing as a Human Process (Toronto: University of Toronto Press, 1971), p. 118.